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Congressional Committee Opens Paper Bids

Quotations for Six Months Supply Beginning July 1, 1937, for Government Printing Office Are Received on Monday from Twenty-five Bidders Which Is the Lowest Number of Bidders Since 1922 — Price Average Higher.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 19, 1937—The Joint Congressional Committee on Printing on Monday received quotations from 25 bidders on paper for the Government Printing Office for the six months beginning July 1. It is estimated that the Printing Office will need approximately 36,915,000 pounds of various kinds of paper during that period.

The 25 bids are the lowest number received since 1922 at which time only 19 bidders were represented.

There were 169 lots on which bids were asked Monday and of this number there were 123 low bids, 14 lots on which no bids were received, and in 32 lots there were tie bids. There was very little identical bidding. It is estimated by the government authorities that the bids taking the whole schedule, were about 20 per cent higher than they were at the last six month bid opening on November 23, 1936.

The Joint Committee will meet on May 24 for the purpose of making awards.

The bids received were as follows:

Newsprint

No. 1—1,000,000 lbs., 24x36—64; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores, with metal ends).

No bid.

Machine-Finish Book

No. 3—250,000 lbs., 25x38—70; flat, cut 24x32, 28x38, and 31¼x45½ ins.

Fitchburg Paper Co.	6.76c
Perkins-Goodwin Co.	6.51c
Whitaker Paper Co.	6.60c
Walker, Goulard Plehn Co.	6.76c
R. P. Andrews Paper Co.	6.55c
The Champion Paper & Fibre Co.	6.60c
Stanford Paper Co.	6.76c
Barton, Duer & Koch Paper Co.	6.76c

No. 4—400,000 lbs., 25x38—70; flat, cut 24x38 and 38x48 ins.

Fitchburg Paper Co.	6.76c
John F. Post, Inc.	6.51c
Whitaker Paper Co.	6.51c
Walker, Goulard Plehn Co.	6.76c
R. P. Andrews Paper Co.	6.55c
Champion Paper & Fiber Co.	6.51c
Stanford Paper Co.	6.76c
Barton Duer & Koch Paper Co.	6.76c

No. 5—400,000 lbs., 25x38—70; flat, cut 24x38 and 38x48 ins.

Fitchburg Paper Co.	6.76c
Perkins-Goodwin Co.	6.51c
Whitaker Paper Co.	6.51c
Walker, Goulard Plehn Co.	6.76c
R. P. Andrews Paper Co.	6.57c
Champion Paper & Fiber Co.	6.51c
Stamford Paper Co.	6.76c
Barton, Duer & Koch Paper Co.	6.76c

No. 6—350,000 lbs., 25x38—70; rolls, 18, 21, and 28½ ins. wide (3-inch iron cores).

Fitchburg Paper Co.	6.14c
Whitaker Paper Co.	6.25c
Walker, Goulard Plehn Co.	6.14c
R. P. Andrews Paper Co.	6.19c
Champion Paper & Fiber Co.	6.25c
Stanford Paper Co.	6.14c
Barton, Duer & Koch Paper Co.	6.14c

No. 7—600,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch iron cores).

Fitchburg Paper Co.	6.14c
Whitaker Paper Co.	6.20c
Walker, Goulard Plehn Co.	6.14c
R. P. Andrews Paper Co.	6.14c
Champion Paper & Fiber Co.	6.20c
Stanford Paper Co.	6.14c
Barton, Duer & Koch Paper Co.	6.14c

No. 8—600,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch iron cores).

Fitchburg Paper Co.	6.14c
Perkins-Goodwin Co.	6.14c
Whitaker Paper Co.	6.14c
Walker, Goulard Plehn Co.	6.14c
R. P. Andrews Paper Co.	6.18c
Champion Paper & Fiber Co.	6.14c
Stanford Paper Co.	6.14c
Barton, Duer & Koch Paper Co.	6.23c

No. 9—350,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide (3-inch iron cores).

Fitchburg Paper Co.	6.14c
Whitaker Paper Co.	6.14c
Walker, Goulard Plehn Co.	6.14c
R. P. Andrews Paper Co.	6.19c
Champion Paper & Fiber Co.	6.14c
Stanford Paper Co.	6.14c
Barton, Duer & Koch Paper Co.	6.23c

No. 10—250,000 lbs., 25x38—80; rolls, 32 ins. wide (3-inch iron cores).

Fitchburg Paper Co.	6.74c
Whitaker Paper Co.	6.35c
Walker, Goulard Plehn Co.	6.74c
R. P. Andrews Paper Co.	6.16c
Champion Paper & Fibre Co.	6.35c
Stanford Paper Co.	6.74c
Barton, Duer & Koch Paper Co.	6.21c

No. 11—400,000 lbs., 25x38—80; flat cut 24x38, 33¾x64, and 38x48 ins.

Fitchburg Paper Co.	6.48c
Whitaker Paper Co.	6.22c
Walker, Goulard Plehn Co.	6.48c
R. P. Andrews Paper Co.	6.26c
Champion Paper & Fiber Co.	6.22c
Stanford Paper Co.	6.37c
Barton, Duer & Koch Paper Co.	6.22c

No. 12—600,000 lbs., 25x38—100; flat, cut 22¼x32¼, 24x38, 24¼x36¼, 32x42, 38x48 and 41x52 ins.

Fitchburg Paper Co.	6.17c
Whitaker Paper Co.	5.98c
Walker, Goulard Plehn Co.	6.17c
R. P. Andrews Paper Co.	5.92c
Champion Paper & Fiber Co.	5.98c
Stanford Paper Co.	5.92c
Paper Corp. of U. S.	5.92c
Barton, Duer & Koch Paper Co.	6.11c

No. 13—15,000 lbs., 25x38—120 and 140; flat, cut 29x41, 32x52, and 38x48 ins. Min. order 5,000 lbs.

Walker, Goulard Plehn Co.	6.17c
Stanford Paper Co.	5.92c
Barton, Duer & Koch Paper Co.	6.11c

No. 14—15,000 lbs., blue and salmon, 25x38—70 and 100; flat, cut 25x38 and 38x48 ins. Min. order, one color, 5,000 lbs.

No. bids.

Machine-Finish Book End Paper

No. 15—40,000 lbs., flat, 25x38—160; the grain to run the 38-inch way.

Fitchburg Paper Co.	6.42c
Walker, Goulard Plehn Co.	6.42c
R. P. Andrews Paper Co.	6.19c
Stanford Paper Co.	6.42c
Aetna Paper Co.	9.00c
Barton, Duer & Koch Paper Co.	6.49c

Offset Book

No. 16—250,000 lbs., 25x38—120; flat, cut 24x38, 26x32, and 38x48 ins.; grain as ordered.

R. P. Andrews Paper Co.	6.54c
Dobler & Mudge	6.54c
Mathers-Lamm Paper Co.	6.54c
Stanford Paper Co.	6.54c
Aetna Paper Co.	8.00c

Antique Book

No. 17—300,000 lbs., 25x38—100 and

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Ernst Mahler Discusses Mill Safety Record

Kimberly-Clark Executive Vice-President States No Labor Law Will Work Just Because It Is On Statute Book — Thomas N. Barrows Receives Degree — Charles D. Thompson Honored by Board of Education.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 17, 1937—Employees of the Kimberly-Clark Corporation's mill at Kimberly, Wis., took a day off on Thursday, May 13 for the second annual community safety rally. They and their families heard speakers, viewed extensive safety exhibits in booths at the mill clubhouse, and attended a closing dinner. It was a climax to a year of intense effort to achieve an outstanding mill safety record.

There was unusual interest in the address made by Ernst Mahler, executive vice-president, at the dinner, because it echoed the present labor unrest. Using the prohibition law as an example, he said no labor law, if the right spirit isn't behind it, will ever work just because it is on the statute books. "I have no fault to find with outside labor organizations," he said. "I realize their strength and weakness.

"I think our way of doing business here with our mill council is the one way and the American way. I feel there will never be a law on the books that will prohibit the free interchange of information between decent employers and decent employees. I don't think the day will come when we can't put our feet under a table and iron out differences of opinion.

"Misunderstanding and misinformation are the real reasons for labor difficulties. I have unlimited confidence that when there are differences of opinion, then the machinery set up in our corporation can settle those differences in the right way."

Another of the speakers was S. F. Shattuck, vice-president of the company, who is credited with being the "father" of the safety movement which for years has bettered conditions for the workers in the mill. "The basis for any sound working relationship is mutual," he said. Employees of the Kimberly-Clark Corporation, by and large, he remarked, have earned the respect of the management, and said he believed it to be true that the management has earned the respect of the employes. He listed as the three major objectives of safety: that the management be right minded with respect for personalities; that the right conditions be provided, a task of both management and employees, and that the employees be right minded. If those objectives are reached, he said, all other problems can be solved. The whole safety program was termed a matter, not of collective bargaining but of collective dealing.

Judge F. V. Heinemann, of the county court at Appleton, Wis., gave an illuminating address on the operation of the state's old age pension system. The history and accomplishments of the safety movement were detailed in an address by A. A. Soldner, of the Wisconsin Industrial Commission. Commendatory talks concerning the enviable safety record maintained by the workers were given by J. T. Doerfler, manager of the Kimberly mill; O. K. Hanneman, representative on the mill council; H. G. Boon, general superintendent, and others. Safety motion pictures were shown.

George Hankwits, of the sulphite department, and Glenn Zwick, of the warehouse, were awarded trips with expenses paid to the Fox River Valley and Lake Shore Safety Conference at Oshkosh, Wis., as the employees submitting the best suggestions for safety improvements at the mill.

Council of Safety to Meet

The Wisconsin Council of Safety, pioneer organization in industrial and traffic safety, will hold its annual meeting at Rhinelander, Wis., Friday, June 11. It will be the day following the Wisconsin Valley Safety Conference at Merrill, Wis. F. E. Town of Manitowoc, Wis., is the president, and C. J. Muth, Milwaukee, Wis., is the secretary. A number of safety executives of the paper mills are expected to attend.

Dr. T. L. Tabern to Speak

Dr. T. L. Tabern of the Abbott Laboratories, Chicago, was to speak on "Barbiturates and Newer Uses in Medicine" at the monthly meeting of the Northeastern Wisconsin section of the American Chemical Society Monday evening, May 17, at the Institute of Paper Chemistry, Appleton, Wis. He is chairman of the medicinal division of the American Chemical Society, and president-elect of the Chicago Chemists' Club.

Thomas N. Barrows Awarded Degree

Thomas N. Barrows, president of Lawrence College and director of the Institute of Paper Chemistry, Appleton, Wis., was given the honorary degree of doctor of laws by Ripon College, Ripon, Wis., at ceremonies last year. The degree was presented by Frank J. Harwood, president of Appleton Woolen Mills, Appleton, Wis., who is chairman of the Ripon College trustee committee on honorary degrees. Dr. Barrows received his A. B. degree at the University of California.

Lyman Beeman Joins St. Regis

Lyman Beeman has resigned his position with the Consolidated Water Power and Paper Company Division at Appleton, Wis., and has accepted a position with the St. Regis Paper Company, Watertown, N. Y.

Forthcoming Weddings

Clement Steidl, who recently resigned from the Appleton Coated Paper Company, Appleton, Wis., to become associated with the Oxford Paper Company, Rumford, Me., and Miss Jeanette Clausen of Appleton, were married Saturday, May 15, at Walpole, Mass. Both are graduates of Lawrence College at Appleton.

Lamah A. Moss, who will receive his Ph. D. degree from the Institute of Paper Chemistry, Appleton, Wis., during the June commencement, will be married June 12 to Miss Maurine Engel of Larsen, Wis., who is an assistant librarian at Lawrence College, Appleton. Mr. Moss is from Albemarle, N. C., and is a graduate of North Carolina State College. He has accepted a position with the Gilbert Paper Company, Menasha, Wis.

Quebec May Establish Embargo on Wood Cut

Measure Introduced In Legislative Assembly Revolutionary — Premier Announces Expediency of Supervising Shipping to Places Outside Their Province — Bowater's Buy Scharins Soner Groundwood Pulp Mills.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 17, 1937—The Quebec government has introduced a measure in the Legislative Assembly aiming to establish an embargo on all wood cut in the province of Quebec, whether cut on Crown lands or on private lots. This is a revolutionary measure, and is likely to raise grave questions of constitutionality.

The forests of Quebec cover 259,162 square miles, and of this area some 230,000 square miles are Crown forests. That is to say they belong to the province. The remainder is made up of privately owned forests. A virtual embargo on unmanufactured wood cut on Crown lands has been in effect for some thirty years, and because of this there came into being the pulp and paper mills which have made Quebec the greatest newsprint manufacturing province in Canada.

The embargo was made effective through provisions in all licenses for cutting wood on Crown lands whereby those obtaining leases for cutting agreed to manufacture the wood in the province. No such provision applied to Crown lands, with the result that private owners, among whom are included many farmers, were still free to export pulpwood.

For the year ending March 31 last the total pulpwood exported from the whole of Canada amounted to 746,996 cords, valued at $5,577,611.

The proposed legislation will require all persons shipping unmanufactured wood, no matter where cut to obtain a shipping permit and to pay duty on all wood exported. Whenever questions of this kind have previously arisen it has been held that a province has no right under the constitution to regulate import or export trade, this being a matter under the exclusive jurisdiction of the federal government.

The law on the subject is set forth in the British North American Act, which says in part: "For greater certainty . . . it is hereby declared that (notwithstanding anything in this act) the exclusive legislative authority of the Parliament of Canada extends to all matters coming within the classes of subjects next hereinafter enumerated." Then follows a list of 29 subjects, numbered in order, the second subject being "The regulation of trade and commerce."

Premier Duplessis, in announcing the proposed new provincial legislation, said:

"It is just that the population of the province benefit before others from the enhancing of the value of this natural resource," and "it is therefore expedient to regulate and supervise the shipping to places outside the province of wood coming from our forests."

To these ends, it is enacted in the present measure that "any person, firm or corporation shipping, directly or indirectly, by any means of transportation whatsoever to places outside of the province, wood not worked within the meaning of this Act and coming from public or private lands in the province, must previously obtain a shipping permit issued by the Department of Lands and Forests, upon payment of such fees as the Lieutenant Governor in Council may fix. Such permit shall remain in force for one year from its issue."

It is enacted:

"The Lieutenant Governor in Council may in addition impose duties respecting the shipping contemplated in the preceding section, which shall not in any case exceed $5 per cord of wood of 128 cubic feet, with respect to wood which can be measured by the cord and per 100 solid cubic feet with respect to any other wood."

In regard to shipping licenses, it is provided that at the expiration of every month or at any other period determined by the Lieutenant Governor in Council, every person, firm or corporation must transmit to the Minister of Lands and Forests in the city of Quebec such sworn information and reports as may be prescribed by the Lieutenant Governor in Council.

What is wood which is described as "worked" in the province? The Government will decide, under the following clauses, to wit:

(a) Define what is worked wood within the meaning of this Act;

(b) Determine the form and the manner of the issuing of the permits;

(c) Prescribe the fees, not exceeding $100, payable upon the issuing of the permits;

(d) Establish tariffs of duties payable upon the wood shipped to places outside of the province, in conformity with this Act;

(e) Determine the manner of collecting and of paying such duties;

(f) Prescribe any other provisions which he may deem expedient for the carrying out of this Act, provided they be not inconsistent with the latter.

As to the duties to be imposed on shipment of wood, these will vary according to the kind of wood, its source and its destination, the purposes for which it will be used and its degree of preparation.

When settlers and farmers are permitted to ship wood, the duties will be remitted.

Bowater's Buy Swedish Pulp Mills

Bowater's Paper Mills, the famous British firm of newsprint manufacturers, who some time ago submitted a proposal for taking over Price Brothers & Co., of Quebec, are announced in a dispatch from London to have completed the purchase from Scharins Soner of two groundwood pulp mills, situated near Umea, Sweden. The price is stated to be about $280,000. The dispatch adds:

"The mills are favorably situated for shipments of their output to this country and are said to be among the most modern and economical in Sweden. The present productive capacity of these mills is in excess of 130,000 tons of groundwood pulp per annum, but they are readily capable of expansion, the necessary power being available.

Cambridge Box to Open New York Office

Due to Increased Business Step Is Considered Necessary—Former Superintendent of E. M. Low Advances to Haigh Paper Box Co. — Third Carter-Rice Outing — Knight, Allen & Clark Add Pine Tree Cover.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 17, 1937—Due to increased business in various lines, the Cambridge Paper Box Company, Cambridge, Mass., is shortly to open a New York office. On account of rapid growth in the last few years, the company is to install additional equipment. The art department is to be enlarged and a new office established due to more activity. G. H. A. Gooding, general manager of the Cambridge Paper Box Company, is to pass June in California. While en route he will visit large box manufacturers.

W. A. MacConnell Advanced

W. A. MacConnell, formerly superintendent of E. M. Low, a paper box concern, Brockton, Mass., and previously superintendent of the old Climax Paper Box Company, Cambridge, has become superintendent of the Haigh Paper Box Company. Grover Haigh, treasurer of the Haigh Paper Box Company, has withdrawn from the company and entered another line of business.

Orders for Paper Fair

The volume of orders for paper in the Boston wholesale market was fair to good during the last week. Although business slacked off considerably in some quarters of the fine paper division, the demand as a whole was favorable. The call for diploma papers has been rushing in. In wrapping paper, the demand was better than the previous week. At one house, it was stated that business conditions were very, very good. Department and other store business has improved since the first of the month, with a consequent demand, although business as a whole has fallen off a bit. Box board was not very active.

With the exception of a few grades, the paper stock market was quiet. In old papers, mixed papers and corrugated boxes were in demand, but old newspapers were a little draggy. Mixed papers continued firm at .60 @ .65 and corrugated boxes advanced to .85 @ .90, both f.o.b., Boston. Old newspapers remained at .60 @ .65 f.o.b., Boston.

Bagging as a whole did not have the "pep" which was recently current, although domestic scrap burlap advanced a few points on the low side, being quoted at 1.90 @ 2.10, compared with a previous price of 1.85 @ 2.10 f.o.b., Boston.

New domestic rags continued steady. Under old domestic rags, No. 1 roofing stock declined to 1.45 @ 1.55 from 1.55 @ 1.65 and the No. 3 grade to 1.15 to 1.25 from 1.25 @ 1.30, both f.o.b., Boston. No. 2 roofing stock continued at 1.45 @ 1.50, f.o.b., Boston.

Foreign rags were in a somewhat better position to be bought by importers, being a little lower abroad. Dark cottons continued at 1.90 @ 2.00, f.o.b., Boston.

Carter Rice Outing

The third annual Carter-Rice outing is to be held at the Stow Country Club, Stow, Mass., Saturday, June 19. The party will leave the building of the company at 9 a.m. The announcement of "The Stowaways" annual event (with the quoted words in long-hand, representing twine) contains humorous illustrations of features of the program, including swimming, golf, dinner and dancing.

Twine Meeting Entertained

Twenty-seven members of the sales force of Carter, Rice & Co., Corp., were guests of Frank C. Herrick, of the Columbian Rope Company, Auburn, N. Y., at the Boston City Club Friday evening, May 7, for the fourth and final gathering in a series of twine meetings. After the meeting, which lasted an hour and a half, dinner was served. As a surprise, two chair prizes were awarded to those who sat in lucky seats. Daniel Sullivan received a handsome bill fold and Wilbur Woodbury an attractive brief-case.

Knight, Allen & Clark Adds New Line

Knight, Allen & Clark, Inc., have taken a new line, Pine Tree Cover, made by the Pejepscot Paper Company, of Brunswick, Me., which they have stocked for immediate delivery to the printer.

Harry J. Dowd Visits New York

Harry J. Dowd was in New York Friday in connection with the organization of the Eastern States Paper and Bag Distributors Association.

Middlesex Introduces Colored Foils

The Middlesex Products Corporation, Cambridge, Mass., is introducing to the trade a new line of Fade-Less Colored Foils for box makers. Middlesex claims that the new line of colors is the most sunfast line available today from any source, domestic or foreign.

Gaspesia Sulphite Co. Gets Chandler Mill

The Gaspesia Sulphite Company, Ltd., has acquired the sulphite pulp mill of the Premier Pulp and Paper Corporation, Chandler, Quebec. The directors of the Gaspesia Sulphite Company, Ltd., are as follows:—R. A. MacInnis, president; W. G. Clarke, J. A. Coulombe, J. Mercier, Paul Gauthier, Sir Geo. Sutton and Mr. Sursham, of London, England.

Repairs to the mill are being rushed as rapidly as possible and it is expected that it will be placed in operation some time in July.

There is no public financing and the financial structure provides only for common shares.

New Link-Belt Folder

A new 4-page illustrated folder No. 1435, giving full information, with list prices of the new Link-Belt Super Salem Steel Elevator Bucket will be sent to any reader upon request, which may be addressed to Link-Belt Company, 2410 West 18th Street, Chicago, Ill., or to the nearest office of the company.

Pulpwood and Naval Stores Production

Paper and Pulp Manufacturers In South Must Conserve, Develop and Perpetuate Southern Pine Lands—Forestry Leaders Provide Encouraging Outlook for Ample Future Supplies of Pulpwood and Naval Stores.

By J. E. Lockwood*

The purpose of this article is to bring to the attention of present and potential owners of Southern pine lands, the essential importance of naval stores production from living pines, in combination, with pulpwood requirements and their final uses when the timber has matured and is cut down. Also, to insure full consideration of naval stores possibilities, in all forest planning and management that seeks a means of supplying needed timber materials for Southern industries at low unit-cost to users, while securing high net returns per acre to timberland owners.

During the last year or more some of our foresters and economists have called particular attention to the large and increasing pulpwood requirements for Southern pulp and paper mills, in addition to the timber requirements of sawmills and other timber using industries. They have expressed fears of a gradual decrease in our pine forest resources and eventual devasted timberlands. But their apparent failure to consider naval stores production and its possibilities in combination with pulpwood requirements, indicated their study was not complete and their fears not well founded.

Forestry Leaders Optimistic

However, during the last few months, some of our best informed and forward looking forestry leaders have painted a brighter picture and provided a more encouraging outlook that promises ample and perpetual supplies of naval stores, pulpwood and timber materials, at low unit-cost to users and with high net returns per acre to timberland owners. This is indicated by the following:

E. W. Tinker, assistant chief, U. S. Forest Service, in an address to the Southern Agricultural Workers Association's annual convention at Nashville, Tenn., on February 3, 1937, relating the vital part the forests of the South form of its economy, stated: "The timberlands of the South should be managed on the basis of their productivity as a business enterprise and made to pay a reasonable return to the owners. Pulpwood . . . should be harvested with a view to maximum production from the land that is being operated . . . The possible returns from the land in the form of naval stores and saw timber should be given equal weight. Most foresters . . . are in agreement that with the prolific production capacity of Southern forests all of the pulpwood that can be absorbed may be removed in the form of cultural and improvement cuttings and in the form of thinnings. This process will assure not only the maintenance of pulp and paper plants but also the continuous operation of the sawmill industry."

E. L. Demmon, director, Southern Forest Experiment Station, New Orleans, La., in Occasional Paper No. 59, on Economics For Our Southern Forests, dated February 23, 1937, states:

"Let me briefly summarize the place of forestry in the future of the South. Private forestry can be practiced and made to pay. One of the surest means of insuring a profit from forest lands is to make them serve many uses. One of the primary requisites is that only the annual production of 'interest' be removed each year and that the capital stock or 'principal' be conserved. On National Forests 'multiple-use-forestry' is the accepted policy of management. If we are to have sustained-yield private forestry, it also must take into account such a policy of management."

I. F. Eldredge, Regional Survey Director of Southern Forest Experiment Station at New Orleans, who had charge of the recently completed survey of our Southern forest lands, in a letter dated January 8, 1937, to J. C. Nash president, Columbia Naval Stores Company, Savannah, Ga., regarding the immediate future outlook for naval stores production from living pine, stated:

"Our most careful estimates to date indicate that in the naval stores region as a whole the industry can continue to produce at least 550,000 units annually without any hiatus . . . If all the turpentine pines in the naval stores belt were dedicated to naval stores operation prior to use for wood products, the annual sustained production of gum turpentine and rosin could be raised in the next fifteen years to at least 800,000 units . . . It is impracticable, however, to expect existing and incoming wood products industries to refrain entirely from cutting round turpentine pines . . . It seems safe to assume that if the land owner can get good prices for his round timber for turpentining under reasonably long leases he is not apt to cut very much of it for pulpwood at fifty cents or less per acre."

Dr. Herty's Views

And, Dr. Charles H. Herty, our leading discoverer and demonstrator of the possible uses of Southern pine, including his original cup-system of naval stores production and his recent pulp and paper demonstrations, during a discussion of this subject and article with the author, stated:

"I have long advised the reforestation of our Southern cut-over timberlands with longleaf and slash pines and strongly urged fire protection for Southern forests. I now advise working-for-turpentine all suitable timber before it is cut down for final uses, with the exception of such trees as there may be warrant for selecting and reserving for a final crop of high grade sawlogs or poles. Such preliminary use of second-growth longleaf and slash pines will not endanger our pulpwood supply, as the total quantity of pulpwood available from cuttings for forestry thinning purposes, from worked-out turpentine timber when cut down, and from loblolly pines that are not suitable for naval stores production, will together

* Naval Stores Consultant, Savannah, Ga.

provide an ample supply of pulpwood for present and proposed Southern pulp and paper mills," to which he added:

"With proper fire protection for Southern forests eliminating the annual burning-over of turpentine timberlands now generally practiced by gum naval stores producers, I estimate there will be an increase of approximately fifteen per cent in the average yield of naval stores, with no increase in naval stores production cost, per crop of timber worked."

It is therefore evident from the foregoing that the forestry leaders mentioned, are agreed, that in multiple-use forestry and conservation by means of sustained-yields, lies assurance of sufficient supplies of needed forest materials to fully supply our current and near future needs, while by means of the reforestation of our cut-over timberlands with slash and longleaf pines, we will be assured of ample and perpetual supplies of forest materials to provide for the continuous operation of Southern timber-using industries.

Multiple-Uses

Regarding multiple-uses. In the last few lines of the quotation from Captain Eldredge's letter, is implied what is quite generally realized, namely, that the greatest single source of annual income from Southern second-growth pines is naval stores production, and that the income from pulpwood production is relatively small. To date the income from naval stores production has constituted the major part and the income from all final uses the minor part, of the total income from each crop of turpentine timber. This is due to the preliminary use of turpentine timber for naval stores production continuing for many years—usually fifteen to eighteen—with an income for each year worked-for-turpentine, while the final use for timber materials and pulpwood only secures an income once, namely when the timber is cut down.

The place and importance of naval stores in our Southern forest situation is more fully shown by the following: For more than a century our Southern pine forests have been the source of more than two thirds of the world's supply of turpentine and rosin, the principal products of the naval stores industry. About half of our production has been required for use by our company's soap, paper, paint and varnish and other essential industries. The remaining half has been exported for similar requirements in foreign countries.

Naval Stores Output

Our past annual production of naval stores from living pines, has ranged from a maximum of 750,000 units in 1908-09 to a minimum of 340,000 units in 1918-19, and averaged about 500,000 units during the last few years. According to the authoritative estimate of Captain Eldredge, it can be continued indefinitely at about 550,000 units, or, within fifteen years may be increased to at least 800,000 units. The unit consists of one barrel of turpentine and three and one-third round barrels of rosin.

The recent annual production of 500,000 units has been secured by working-for-turpentine approximately 12,500 "crops" of 10,000 faces each on 125,000,000 turpentine pines, that were only thinly distributed, they required 500 acres or more for each crop and only averaged about twenty turpentine trees per acre. By means of reforestation starting with say 600 to 1,000 young slash or longleaf pines per acre, then at approximate times of cutting-out some of the smaller pines to improve the growth and quality of the remaining stand, and including the working-for-turpentine of suitable timber during practically half of its life, the timber that matures at from twenty-five to forty years age, according to conditions and requirements, should average 100 turpentine pines per acre.

With the average number of turpentine pines per acre thus quadrupled, it is apparent that the price per crop of turpentine leases could be reduced to half the annual net returns per acre to the timberland owner, present average and still secure double the present and with similar increased supply and possible lower unit prices for timber materials. Therefore the development of a sufficient increase in demand for their products, to fully absorb the larger supply that will then be available, should not be difficult, with lower unit prices then possible.

As some potential owners of Southern pine lands have mentioned the possibility of uncontrolled forest fires causing material damage or serious losses to Southern forests, it is only necessary to mention that forest fire protection has become quite general and effective at a cost of a few cents per acre per annum, and that with forest fire insurance now available through Federal Land Banks, this slight hazard has been eliminated.

Forest Policy

The past lack of any constructive and comprehensive forest policy in the South has resulted in the practical exhaustion of our virgin longleaf pine forests, leaving us dependent on our new forest resources consisting almost wholly of second-growth slash and longleaf pines, principally the former. While the naval stores and lumber manufacturing industries have lacked or failed to exercise sufficient control over our Southern pine forests to insure the conservation and perpetuation of this valuable natural resource, it should be realized that the relatively large number of individually small interests in these industries made it difficult or impossible to secure such collective consideration and co-operative support of a constructive forestry policy as was needed.

However, the recent large capital investments in Southern pulp and paper mills and their tributary timberland, brings a new industry with more favorable conditions into the Southern forest situation. Their limited number and individually large capital investments in Southern mills and lands, is a fortunate condition. Their need of new large and continuous supplies of pulpwood at reasonable cost, while their northern supplies are decreasing and prices increasing, together with Dr. Herty's demonstration of the suitability of Southern pinewood for pulp and paper making, makes our Southern pine timber resources and possibilities very attractive. The promptness and completeness with which they have seen and availed themselves of their opportunity, evidences the qualities and ability which are needed in our Southern forest situation.

So instead of fears that the increasing pulpwood requirements will lead to the gradual exhaustion of our Southern pine forests, we should realize that their increasing capital investments in Southern mills and tributary timberlands, holds the best possible promise of their determining and doing whatever is necessary or desirable to protect, conserve and perpetuate our Southern pine forests, with benefits and profits to all concerned.

Financial News of Pulp and Paper Industry

International Paper and Power Co. Reports Net Profit of $1,746,577 for First Quarter—J. H. Hinman Made Director of I. P. Co. — Masonite Declares Extra and Regular Dividend — Northern Mills Earn $201,307.

New York Stock Exchange

High, Low and Last for the Week Ending May 19, 1937

	High	Low	Last
A. P. W. Paper Co.	7⅞	7½	7¾
Armstrong Cork Co.	61⅛	57½	61
Celotex Corp.	40	38¾	38⅞
Celotex Corp., pfd.	76¼	73¾	75⅛
Certain-Teed Products Corp.	15⅞	14½	15¼
Certain-Teed Products Corp., pfd.	68	60½	63
Champion Paper & Fibre Co.	57	53½	57
Champion Paper & Fibre Co., pf.	108½	108	108
Congoleum Nairn Co.	38	37	38
Container Corp. of Amer.	32¼	30	30¾
Continental-Diamond Fibre Co.	20½	19¾	20
Crown Zellerbach Co.	20⅛	18	19⅝
Crown Zellerbach Co., cum. pf.	100¾	99½	100½
Flintkote Co.	32¾	39⅛	30½
International Paper & Power (a)	17⅜	16¾	17⅛
International Paper & Power (b)	13⅛	12	12⅝
International Paper & Power (c)	6⅜	6⅛	6¼
International Paper & Power pf.	102½	96	100¾
Johns-Manville Corp.	129½	123½	129½
Kimberly-Clark Corp.	42½	39	41
MacAndrews & Forbes	31	30¾	30¾
Masonite Corp.	56½	54½	56
Mead Corp.	28½	26½	28½
Mead Corp. pf.	93½	93½	93½
Paraffine Companies, Inc.	71	69	69
Paraffine Companies, Inc., pf.	101	100	100
Scott Paper Co.	40	38½	39
Sutherland Paper Co.	36	34½	35
Union Bag & Paper Corp.	79	76	79
United Paperboard Co.	13¼	12¼	13
U. S. Gypsum Co.	109⅛	107	108½
U. S. Gypsum Co., pf.	156	156	156

New York Curb Exchange

High, Low and Last for the Week Ending May 19, 1937

	High	Low	Last
American Box Board Co.	20⅞	20½	20
Brown Co., pf.	70	61¼	69
Great Northern Paper Co.	40	37½	40
St. Lawrence Corp.	11	10¾	10¾
St. Regis Paper Co.	9¼	8⅞	8⅞
St. Regis Paper Co., pf.	105	100	102
Taggart Corp.	12	10⅞	11½

I. P. & P. Co. Annual Report

The 1936 annual report and the first quarter earnings of International Paper and Power Company have just been released.

The earnings and certain other figures from the 1936 report appeared in the Application to the Securities and Exchange Commission dated March 10, 1937, and in the Amendment No. 1 dated March 29, 1937, and have been published.

The first quarter earnings have not been released before. We are quoting below from the remarks of Richard J. Cullen, president of the company.

"Operations for the first quarter resulted in a net profit of $1,746,577 before deduction for possible payment of tax on undistributed profits, compared with a loss of $402,674 in the first quarter of 1936. This profit is substantially more than was included for the first three months in the budgeted earnings of $9,000,000 for the year 1937.

The budget for 1937 was based on the old method of valuing inventories which has now been changed to the more conservative method explained below. It is thus apparent that unless general business conditions change radically from present trends, the actual profits for the year, even on the new basis of valuing inventories, should exceed the budgeted figure.

"Prior to 1937 the inventories of the company have been valued on the basis of 'cost or market, whichever is lower'. During a period of rising costs this method results in an inflation of earnings by selling goods purchased at lower price levels which must be replaced at current higher prices. Correspondingly there is an inflation of inventory values representing the increase in the cost of goods purchased to replace those consumed.

"To avoid such an inflation of earnings and inventory values and to eliminate the necessity for charging off large inventory losses in some later period of declining prices, the company has adopted the policy, beginning January 1, 1937 of computing the cost of sales and the value of inventories on the basis that the latest materials purchased or finished products made are the first used or sold. This method, which is known as the 'last in, first out' basis, will tend to maintain inventory unit values at approximately the level existing January 1, 1937.

"Under the new method of valuing inventories the net profit of $1,746,577 for the first quarter of 1937 is $620,000 less than the profit would have been had the method previously in force been used. In subsequent quarters it will not be possible to determine the amount of difference which results from this new inventory basis since the only figures available will be those based on the new method."

I P Elects J. H. Hinman Director

The stockholders of International Paper Company at their meeting in Corinth, New York, May 12, elected John H. Hinman a director and reelected all present directors for the ensuing year.

The meeting was adjourned until July 21 without taking action on the proposal for reduction of the amount carried in capital account in respect of the 1,000,000 shares of common stock of the company from $52.50 a share to $15 a share.

It was considered advisable to postpone action on this matter until after final action has been taken with respect to International Paper and Power Company's plan for change in capitalization.

National Container Issue

Offering has been made of an issue of $2,000,000 of fifteen-year 5½ per cent debentures, with nondetachable stock-purchase warrants, and 175,000 shares of common stock of $1 par value of the National Container Corporation. The debentures, offered by Bond & Goodwin, Inc., are priced at $100 and accrued interest, and the common stock, offered by A. W. Porter, Inc., and Bond & Goodwin, are offered initially at $12.50 a share.

The proceeds from the sale will be used by the company to construct a pulp and board mill at Jacksonville, Fla., to supply the principal raw material that it and its manufacturing subsidiaries use in their operations. The new mill, estimated to cost about

$3,260,000, will have a daily capacity of approximately 200 tons.

The 5½ per cent debentures carry non-detachable stock-purchase warrants entitling the holder of each $1,000 debenture to buy twenty-five shares of common stock at $12.50 a share between October 1, 1937, and April 1, 1939; at $15 a share between April 2, 1939, and April 1, 1941, and at $20 a share thereafter to April 1, 1942, when the warrants will expire.

The company has reserved 50,000 common shares for the exercise of the warrants, and if all are exercised at the minimum price it will receive proceeds of $625,000, which will be used to retire debentures.

Container Files Statement

WASHINGTON, D. C., May 11, 1937—Container Corporation of America has filed a securities act registration statement with the SEC covering 130,708 shares capital stock, $20 par, to be offered stockholders of record June 3, on the basis of one share additional stock for each five shares held, at $23 per share. Right to subscribe expires June 28.

Unsubscribed for shares will be offered at market. Proceeds will be used for payment of bank loans, capital improvements and for working capital. No underwriters were named. The statement is a refiling.

Masonite Declares Extra and Regular

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 17, 1937—Regular and extra dividends were declared by the Masonite Corporation, Wausau, Wis., by the directors at a meeting last week. Holders of preferred stock as of record May 20 will receive $1.25 a share on June 1. Common stockholders as of record May 25 will receive a regular dividend of 25 cents a share payable June 10, and an extra dividend of 50 cents a share.

A. H. B. Jordan Heads Everett

A. H. B. Jordan has been elected president and treasurer of Everett Pulp and Paper Company, Everett, Wash., succeeding the late William Howarth. Mr. Jordan was formerly vice president in charge of production. William J. Pilz continues as vice president and general manager.

Northern Paper Earnings

Northern Paper Mills and Subsidiaries report for 1936: Net income, $201,307, equal, after preferred dividend requirements, to $2.27 each on 73,337 common shares compared with net income in 1935 of $61,329, or 37 cents a common share.

Oxford Paper Registrar

BOSTON, Mass., May 11, 1937—The Old Colony Trust Company has been appointed registrar for $5 preference stock of the Oxford Paper Company, Rumford, Me.

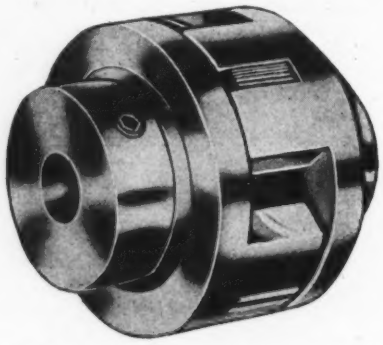
Great Northern Paper Dividend

An extra dividend of 13 cents was declared on the stock of the Great Northern Paper Company together with the regular quarterly of 25 cents a share. In previous quarters 12 cents extra was paid.

New Waldron Coupling

The John Waldron Corporation of New Brunswick, N. J. has recently designed an entirely new Fractional Horse Power Flexible Coupling to meet the demands for this type of coupling in the power transmission field. This new all-steel coupling is recommended for fuel pumps, fans, generators, etc. up to ¾ h.p. at 1800 r.p.m. and for shafts up to ¾ inch diameter.

It provides free and independent lateral floating of



the connected hafts, accurate alignment surfaces, an assembled one-piece all steel center member, large load carrying surfaces, is torsionally resilient, mechanically flexible and silent at any speed.

This new coupling is fully described and illustrated in Francke Bulletin No. 53 just issued by the John Waldron Corporation, copy of which will be sent upon request.

New Modified Silicate Adhesive

A recent discovery in the laboratories of the Philadelphia Quartz Company, Philadelphia, in the process of manufacturing silicate-clay adhesives, has made available a new material which is of great interest to the corrugated paper board industry.

The properties of the liquid and the solid components are so adjusted as to regulate accurately the degree of penetration into the paper surface to which the adhesive is applied. The adhesive remaining on the surface sets rapidly and stays where it is put.

The setting process is not a heat reaction so that high speeds are possible without extreme heat. This is a distinct advantage in plants where continuous increased production is vital. The resultant product gives a board of unprecedented stiffness without warping or distortion.

The new adhesive is able in its standard form to deal with great variations of paper quality and machine adjustment encountered in the manufacture of container board. Later, grades of the new adhesive will be devised to meet the requirements of industries other than the container board.

United Paperboard Dividend

United Paperboard Company, Inc., has resumed dividends on the common stock after a lapse of almost eleven years. Directors voted a 30-cent per share payment on the issue, due May 27 to holders of record May 17. The last previous payment was in September, 1926. A $6 dividend on the $6 noncumulative preferred was also voted, payable same date as the common disbursement.

Obituary

Harry F. Donahue

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 17, 1937—The paper industry suffered a severe shock in the sudden death on Thursday last of Harry F. Donahue, president and general manager of Molten Paper Company.

Mr. Donahue was 64 years of age and was born in Holyoke, Mass. He was with the White & Wyckoff Manufacturing Company for a period of years and came to Philadelphia with Riegel & Co. in 1906. After several years with this firm he went with the Howard Smith Paper Mills, Montreal, Canada. In 1914 he returned to Philadelphia to be associated with the Molten Paper Company as treasurer and having full control. At the passing of Mr. Molten in 1919 he assumed the office of president and general manager. These latter years were the most productive of his life, and he remained active up to the last minute.

Most of us catalog those we know as acquaintances and friends. To know Mr. Donahue was to pass at once within the warm circle of friendship, for he was a man whose unfailing kindly humor and zest for life struck sympathetic sparks from all with whom he came into contact and established relationships on a more than casual footing.

His friends and associates mourn one who commanded their respect by his capability and won their admiration by endearing qualities. A sense of loss in his passing will be felt far beyond the bounds of the paper trade.

Mr. Donahue was a former treasurer of The Paper Trade Association of Philadelphia and served on the Board of Governors for a number of years. During the administration of NRA he was appointed on the sub-committee for this area.

Funeral services were held at 1820 Chestnut street, Saturday afternoon at 1 o'clock.

Mr. Donahue is survived by his widow, Mrs. Mary Donahue.

Edward Palmer Strong

Edward Palmer Strong, secretary and treasurer of The Munising Paper Company, died at the Evanston Hospital on May 7, 1937. Interment services were held at the Memorial Park Cemetery Chapel, 2500 Ridge Road, Evanston, Ill.

He was born in Barrie, Ontario, Canada, in 1873. At the age of eleven he came with his family to Marquette, Michigan. Three years later his father's death necessitated his leaving school and shouldering the responsibility with his mother, of caring for the family of four sisters and one brother, all younger than himself. He was then employed by the F. W. Read Lumber Company at Eagle Mills, Mich. When he was twenty years old, he entered the offices of the Duluth, South Shore, and Atlantic Railroad.

Mr. Strong became associated with the paper industry in 1901 when he took a position with The Munising Paper Company. In 1928 he became secretary of the C. H. Worcester Lumber Company in Chicago, moving to Evanston at that time. He was actively associated with The Munising Paper Company and the C. H. Worcester Lumber Company until his death.

Mr. Strong is survived by his widow; three daughters, Grace, Elizabeth, and Dorothy; a son, Edward; and two sisters, Mrs. L. G. Hayter, and Mrs. J. L. Post of Seattle, Wash.

Kenneth Shibley

Funeral services for Kenneth Shibley were held May 4, 1937, in Seattle, Wash. Mr. Sibley died in Virginia Mason Hospital after a week's illness, and is survived by his widow, Marian Shibley, and three children, Bovard, Jean and Lillian. Mr. Shibley was born March 18, 1882 at Yarker, Ont, and in 1908 was graduated from California, with a civil engineering degree.

For over three years he was assistant engineer with the United States Reclamation Service, and in 1912 became manager of the California Filter Company, at San Francisco, Portland and Seattle. In recent years he established the Shibley Company in Seattle with which he was connected until his death.

He was a member of the Technical Association of the Pulp and Paper Industry, American Society of Civil Engineers, American Water Works Association and the Mount Baker Lodge, F. and A. M., at Mount Vernon.

Mrs. George K. Gibson

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 17, 1937—Chicago and national paper circles who know George K. Gibson so well, will join with him in sorrow for the loss of his wife who died Thursday, May 13, in a Florida hospital. The wife of the sales manager for the Mosinee Paper Mills has been ill for a number of years, spending each winter in a Florida winter home in an effort to regain her health. She is survived by Mr. Gibson, a daughter, Catherine, and a son, George B. Gibson. Funeral services were held on May 15 at Orlando while a memorial service was also held on the same day at the Lady chapel, Evanston.

Joseph M. Droney

Joseph M. Droney, aged 35, manager of the Philadelphia office of the Individual Drinking Cup Company, died in that city last Thursday after a brief illness. He was a native of Washington, D. C.

An Eastern High School graduate, Mr. Droney also studied at Georgetown University's Foreign Service School and left here nine years ago as Pittsburgh manager of his firm. Three years later he was transferred to Philadelphia.

Harold E. Cude

Harold E. Cude, aged 51, secretary-treasurer of the Case Brothers, Inc., paper board manufacturers, died in Manchester, Conn., on May 10, during the night. Mr. Cude formerly taught chemistry at Princeton University. He left a widow, son and two daughters.

Centrifugal Paper Stock Pumps

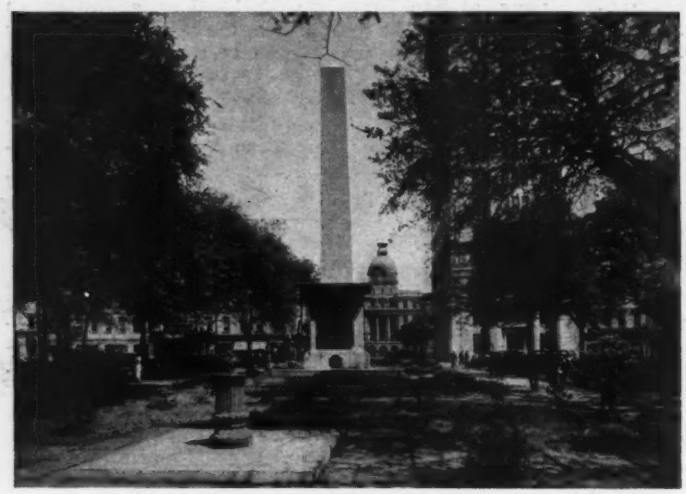
Worthington Pump and Machinery Corporation, of Harrison, N. J., has just published a new catalog on "Centrifugal Paper Stock Pumps."

This catalog, which is profusely illustrated, affords an exhaustive study of the pumping requirements of the pulp and paper industry.

TAPPI to Meet at Savannah

Savannah was selected for the 1937 Fall Convention of The Technical Association of the Pulp and Paper Industry, October 18-20, 1937, due to the intense interest that is being created by the acquisition of new mills in the South along the Atlantic seaboard, as well as the kind invitation extended by the City of Savannah, who wish to make this meeting something in the nature of a welcome to the pulp and paper industry in this section.

The technical papers at the meeting will be of vital interest, the first day's session bearing on wood operations and economics, leading into the subject of pine pulping on the next day, and winding up with pertinent problems from the paper making end for the third day. As a sequence to these papers, arrangements have been made for a visit to the actual scene of woods operation as well as some of the first post-depression Kraft mills to come into production.



BULL STREET LOOKING NORTH THROUGH JOHNSON SQUARE SHOWING GREEN MONUMENT WITH CITY HALL IN BACKGROUND.

The middle of October was chosen as being an ideal time of the year, Indian summer, when the harvest moon will be shining in all its glory, and the City of Savannah through its local reception and entertainment committee will act as host, displaying that fine Southern hospitality for which Savannah is famous.

Headquarters will be at the DeSoto Hotel, which has unusual facilities, including a court garden and terrace with fresh water swimming pool. The Savannah Hotel will also offer excellent accommodations.

On the afternoon of the first day, cars will take the members and their ladies through the plantation section of South Carolina and timber preserves where logging operations may be seen. The return trip will be by boat over the beautiful inland water ways, with Uncle Henry serving mint juleps en route, arriving in Savannah in time for formal banquet and ball, given under the auspices of the City of Savannah; short talks by prominent conservationists and industrial leaders will inspire those at the banquet.

After the reading of the technical papers the morning of the second day and the noon luncheon, members will be given an opportunity to visit the mill of the Union Bag & Paper Corporation, Dr. Herty's Laboratory, and other industries in Savannah.

An informal dinner dance will be the big feature of the second night's entertainment. This will be in the nature of a costume party representing the crinoline days of the deep South, with prizes for the best costume. (Paper costumes will be available for those who do not bring their own). A real Southern dinner will be served, the setting for which will abound in local color and atmosphere; negro spirituals and skit "Gone with the Wind" bringing characterizing details.

The afternoon of the third day will find the members and their ladies at Tybee Beach for an oyster roast and fish fry, supervised by the County, and served by the "chaingang," followed by seashore fun and an opportunity for a dip in the surf; returning that evening for an informal buffet supper and farewell party.

For the ladies, special programs have been arranged by the ladies' local reception and entertainment committee, including sightseeing, swimming, fashion show, golf, bridge and teas at some of the plantation homes.

There are several remarkably fine golf courses at Savannah, and an unusual type of tournament golf is being planned for the members and their guests to be held at the Savannah Country Club.

Those coming by boat, train or car, previous to the convention, or those who wish to carry their travels further afterward, will find full information ready and available as to points of local interest and trips to other mills in this section.

New Morse Chain Clutch

A newly designed high-torque indexing and freewheeling clutch has just been announced by the Morse Chain Company, makers of power drive equipment.

Designed to fill the need for a simple, high-grade, inexpensive clutch to transmit power in one direction, this new unit's construction embodies some interesting features to ensure smooth, positive cam action and to eliminate ratchet noise and backlash.

A few of its many uses are found in machine tools, printing presses, stokers, ventilating fans, automatic heat treating furnaces, and special machinery.

Shapiro's New Line

H. & J. Shapiro Company, Inc., general paper merchants, of 40 West 25th street, New York, announces that the latest addition to their carefully selected line of book and text papers in the new Eagle A. Dartmoor. This is a very new paper of rare distinction and beauty. It has a partly crushed laid formation and its surface is handsomely felt-marked which imparts a rich uniform surface on both sides.

Compare STONITE* with any TOP PRESS or SMOOTHING PRESS ROLL

A comparison by weight or volume of fibre crumbs adhering to any top press or smoothing press roll gives a practical indication of the tendency of the roll to pick up or stick to the sheet. We welcome comparative tests by this method or any other of the remarkably low adhesion of paper to STONITE Top Press or Smoothing Press Rolls. On any grade from board to tissue, STONITE rolls result in an immediate reduction in breaks.

*(*Ebonite and Granulated Stone Composite. U. S. Patent 1,787,890 Re 18,111*)

STOWE-WOODWARD, INC.
NEWTON UPPER FALLS • MASSACHUSETTS
NEW YORK OFFICE • WOOLWORTH BUILDING

Makers of WHITE STAR *Rubber Covered Rolls,* TANNITE *Couch Rolls* STONITE *Top Press and Smoothing Rolls—All by the* COREWELD *Process*

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 19, 1937.—The Government Printing Office has received the following bids for 33,770 pounds of double coated book paper; R. P. Andrews Paper Company at 15.6 cents per pound; Edgewater Paper Company, 15.289 cents; and Dobler & Mudge, 15.1 cents.

The National Pulp and Paper Company will furnish 40,000 pounds of newsprint paper at 2.3 cents per pound, and the Whitaker Paper Company will furnish 46,000 pounds (200,000 sheets) of 38x48" offset book paper at 6.4 cents. Bids for these items were received on May 3.

The following bids were received for 40,000 pounds of supercalendered book paper: Dobler & Mudge, 6.11 cents per pound; R. P. Andrews Paper Company, 6.11 cents; Barton, Duer & Koch Paper Company, 6.25 cents; Stanford Paper Company, 6.11 cents; Paper Corp. of U. S., 6.64 cents; Reese & Reese, Inc., 6.11 cents; and Cauthorne Paper Company, 6.11 cents.

For 50,000 pounds (50,000 sheets) of chip board; Reese & Reese, Inc., at 2.255 cents; Whitaker Paper Company, 2.15 cents; R. P. Andrews Paper Company, 2.2 cents; Barton, Duer & Koch Paper Company, 2.1575 cents; Container Corp. of U. S., 2.37 cents; Virginia Paper Company, 2.15 cents; Old Dominion Paper Company, 2.1689 cents; and J. R. Howarth Paper Company, 2.16 cents.

For 5,000 sheets of red railroad board; Whitaker Paper Company, $30.55 per M sheets; Reese & Reese, Inc., $30.55; Virginia Paper Company, $30.55; Dobler & Mudge, $30.35; Old Dominion Paper Company, $30.547; Barton, Duer & Koch Paper Company, $30.56; and J. R. Howarth Paper Company, $32.84.

For 71,600 pounds (400,000 sheets) of white antique book paper; Cauthorne Paper Company, at 6.17 cents per pound; Reese & Reese, Inc., 6.17 cents; R. P. Andrews Paper Company, 6.17 cents; Barton, Duer & Koch Paper Company, 6.17 cents; Stanford Paper Company, 6.17 cents; Paper Corp. of U. S., 6.21 cents; Mathers-Lamm Paper Company, 6.76 cents and Walker-Goulard-Plehn Company, 6.42 cents.

Reese & Reese will furnish 52 pounds of 22½x28½" No. 1 jute tag at $10, bids for which were opened on April 30.

E. Segessemann Promoted

Appointment of Ernest Segessemann, a member of the laboratory staff of the National Oil Products Company's Harrison, N. J., plant, as chief chemist of the company's new plant at Cedartown, Ga., was announced today by Ralph Wechsler, treasurer and technical director of the firm.

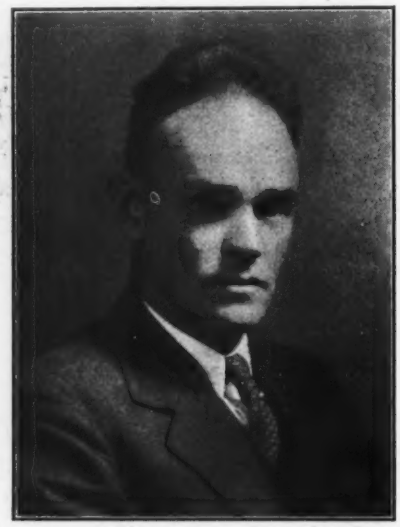
"Mr. Segesseman has been with the company a great many years," Mr. Wechsler said, "and is familiar with the entire subject of production, plant control and analytical procedure."

The company manufactures products used in the paper and similar industries. Other offices and plants are located at Chicago, Boston, San Francisco, Portland and Seattle.

John H. Barton, vice-president in charge of production, announced recently that the new plant would open about May 15.

Graham Blandy's New Post

The American Wood Board Company, and Blandy Paper Company, announce that on July 1, Graham Blandy 2nd., resident manager of the Charles A. Esty Paper Company, Division of Carter, Rice & Co. Corp., at Worcester, Mass., will be associated with them. He will be in charge of sales of both companies and has also been elected president of the



GRAHAM BLANDY

Blandy Paper Company, and vice-president of the American Wood Board Company.

Mr. Blandy became associated with the Charles A. Esty Paper Company, in 1920 and upon the merger of this company with Carter, Rice & Co. Corp., in 1928, was appointed resident manager of the Worcester Division. Previous to this he had several years experience in paper manufacturing.

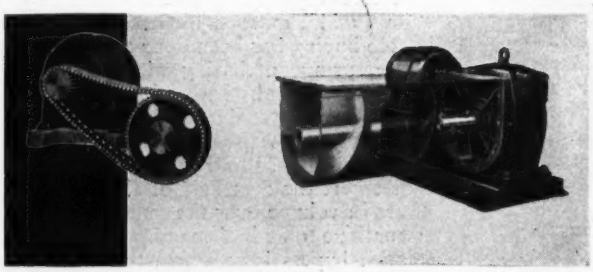
A. T. Hurter Joins Sulphite Co.

A. T. Hurter has resigned from his position as resident engineer for the Iroquois Falls Division of the Abitibi Power and Paper Company, Ltd., and as consulting engineer for other Abitibi mills and subsidiaries. He will be connected shortly with the Lake Sulphite Company, Ltd., who are building a 200-ton bleached sulphite mill at Red Rock, near Port Arthur, Ont.

He was with the Abitibi from 1929, coming here from the St. Lawrence Paper Mills Company, Ltd., and was previously with Geo. F. Hardy, consulting engineer of New York, for several years.

High Intensity Mercury Lighting

A catalog describing many types of industrial lighting equipment for use with 200 and 400 watt high intensity mercury vapor lamps has been published by the Westinghouse Electric and Manufacturing Company. Combination mercury-incandescent units are also described. Vapor proof units for severe service conditions are included. Copies of the catalog are available from the Lighting Division, Westinghouse Electric and Manufacturing Company, Cleveland, Ohio.



THE SYMBOL OF QUALITY

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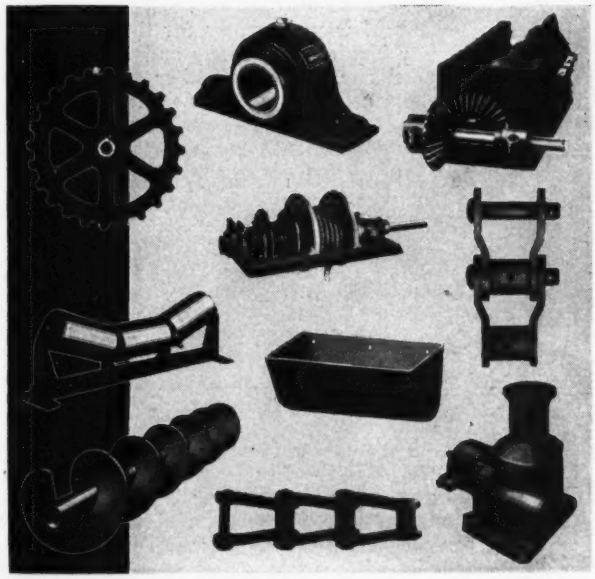
LINK-BELT

WHAT "BUILT *by* LINK-BELT"



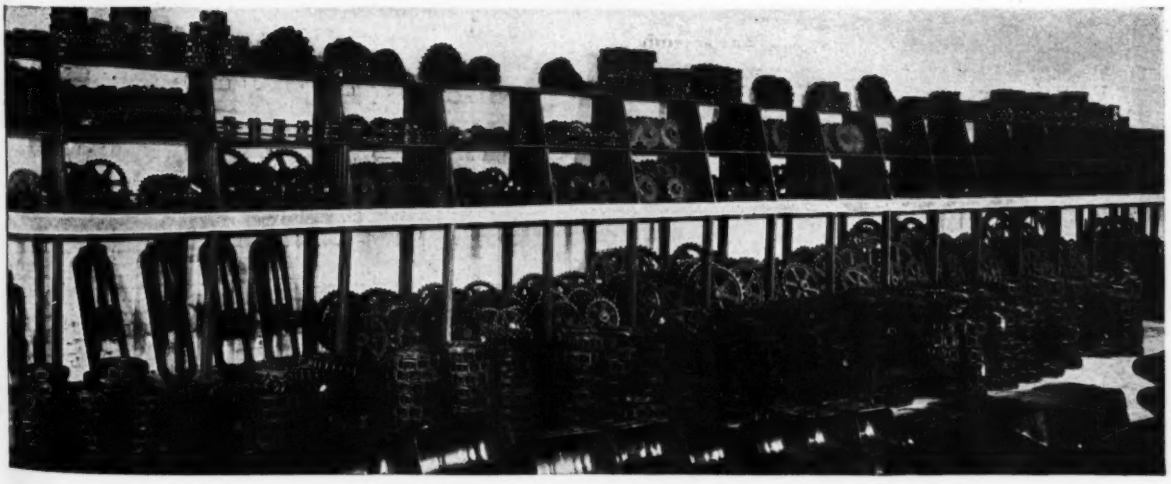
MEANS TO YOU

● It is an assurance of reliable performance, long life and maximum efficiency in all elevating, conveying and power transmitting services through your plant. The Link-Belt standard of quality, plus superb service, is yours for the asking. Large stocks are carried at all Link-Belt plants and warehouses and by many distributors.

LINK-BELT COMPANY

CHICAGO PHILADELPHIA INDIANAPOLIS
ATLANTA SAN FRANCISCO TORONTO
Offices in Principal Cities

A-46-A



Paper and Cordage Men to Meet

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 17, 1937—The Philadelphia Paper and Cordage Association, Inc., will hold its regular monthly meeting on Friday of this week, at the Adelphia Hotel. President E. K. Lay will preside, and will have as guest speaker C. A. Spaulding, assistant secretary of the National Paper Trade Association. This promises to be the most important discourse of the current year and the members are making arrangements for some of the executives and salesmen of their respective organizations to attend. E. L. Richards, Buffalo Envelope Company, chairman of the Golf Committee and his co-workers, F. W. Hastings, American Writing Paper Company, A. B. Sherrill, mill representative, and T. H. B. Smythe, J. L. N. Smythe Company, have arranged plans for the monthly golf tournament to be held on Friday, May 28, at Whitemarsh Valley Country Club. Play will start at 2 o'clock. Those who attended the first match have nothing but praise for the way the tournament was handled and are looking forward to this one on the 28th. The prizes will be very unusual, as great care has been taken in their selection.

Harry S. Platt, Denney Tag Company, chairman of the publicity committee of the association, has issued last call for all those members who have not as yet done so, to send in their letterheads which are to be included in the Directory that is to be furnished each member of the association so that wherever possible, patronage will be given those listed in this Directory.

Moore & White Quite Active

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, PA., May 17, 1937—Moore & White Company are rebuilding a 70-inch trim machine for Beach Arthur Kleen Products Corp. at Modena, Pa. This machine will be used for making light weight tissue and various sulphite papers.

This company is also building ten vertical bleachers for the Pulp Bleaching Corporation for their new plant at Brunswick, Ga., and have booked orders for Moore & White patented four drum winders and slitters for the New York and Pennsylvania Company at Lock Haven, and the Everett Pulp and Paper Company at Everett, Washington.

Moore and White Company report they are running to capacity on other general repair work for paper mills.

U. S. and Ecuador Agreement

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 19, 1937—At the hearing on a proposed reciprocal trade agreement between the United States and Ecuador, T. H. Hassold, assistant secretary of the Bates International Bag Company appeared with a request that a reduced duty rate be secured on exports of multi-wall bags from the United States to Ecuador. A sufficient reduction in the rate on American merchandise was asked to give the American manufacturers an opportunity to meet German and French competition. Both countries, it was stated, have at present a preferential rate over the American made bags, with the result that these countries, Germany in particular, have been securing business formerly placed with the American producers.

Indiana Paper Demand Expands

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, IND., May 17, 1937—Demand for most grades of paper continued to show a gradual expansion during the past week. Rain and cool weather did not help the local situation in many grades, but there is a strong undertone to the market that gives the manufacturers and jobbers encouragement. Inquiries have begun arriving from commercial fruit and vegetable growers concerning prices for cartons and similar equipment for the coming season. No buying has been done as yet and because of the late spring purchasing will start about three weeks later than usual. Indications point to a large volume of this business during the season.

Demand for coarse paper and bags continues to show improvement. Local manufacturers of shopping bags assert the first half of the year will show an increase in volume over the same period last year. Tissues continue to be in demand.

Newsprint buyers have begun to get a little worried over the prospect for the remainder of the year. Reports from Canada to the effect that a newsprint shortage is likely has caused some concern and in many instances contracts are more easily signed than they have been. Advertising lineage continues to improve.

Makers of waxed cartons for the food processing trade say inquiries are heavy and the season should be a good one. Box and other container factories report expansion, with prices firm and some indication of advances. The demand for building papers and roofing also has shown a gradual expansion during the spring and the summer season should be one of the best in years.

Summer specialties have not begun moving to any extent, due to weather conditions, but the first real warm week will see a rush to the market.

Paper stock men report a favorable market condition, with mill demand increasing and prices showing strength. Best grade rags and papers continue to have the call.

Hawley Wins Fire Award

A directed verdict for the plaintiff has been ordered by Federal Judge Fee in the case of the Hawley Pulp and Paper Company against thirteen insurance companies. The case concerned property destroyed when the pulp mill's chipper mill burned in 1933.

The Hawley company demanded $76,500, the insurance companies maintained shrinkage in valuation made them liable for only $52,000. The decision also carried with it 6 per cent interest on the money from July 28,1934, and $7000 attorney's fees. The defendants announced they will appeal.

Side-run Newsprint Dutiable

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 19, 1937.—The Commissioner of Customs, James H. Moyle, in a recent letter to the collector at Ogdensburg, N. Y., has held that side-run newsprint paper in rolls of 20 inches or 20⅜ inches in width, not shown to be of a width chiefly used in newspapers, is dutiable as uncoated printing paper, not specially provided for, at the rate of ¼ of 1 cent per pound and 10 per cent ad valorem under paragraph 1401 of the Tariff Act of 1930.

Superior Performance

A CHALLENGE WE GLADLY ACCEPT

PMC products are offered on their long record of superior performance, and on the continuous watchful service that PMC representatives bring to mill operators. Better chemicals or better service are not available.

In many mills these statements will be heartily endorsed; not in all mills, however, because no one supplier has a monopoly in this important field. We respect honest doubts and accept them as a fair challenge. We are confident that we can prove these assertions to mill operators who sincerely want the best in quality and service.

Paper Makers Chemical Division

HERCULES POWDER COMPANY
INCORPORATED
KALAMAZOO, MICHIGAN

Stoneham, Mass. Holyoke, Mass. Providence, R. I. Albany, N. Y. Carthage, N. Y. Lockport, N. Y. Easton, Pa. Wilmington, Del. Atlanta, Ga. Savannah, Ga. Jacksonville, Fla. Pensacola, Fla. Marrero, La. Kalamazoo, Mich. Milwaukee, Wis. Chicago, Illinois Portland, Ore. San Francisco, Cal. Freeman, Ont. Erith, England

PM-44

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills

Consolidated Plans Improvements

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 17, 1937—An improvement and expansion plan to cost more than $1,500,000 has been announced by the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis. The major portion of the program will be centered at the company's main mill at Wisconsin Rapids, where an extension of the sulphite mill westward from the present plant is planned, with the addition of two digesters which will increase the sulphite output 45 tons daily.

The bleach plant also will be enlarged to handle the conversion of the increased pulp supply. The building will be extended so as to accommodate installation of three chlorinators, two new final stage bleachers, additional washers, tanks and piping and three new filter beds.

A complete new paper machine is to be installed, with a production capacity of 40 tons daily. Its construction will include a unit to apply coating right on the machine using the patented process the company is now using on some of the other machines at the main mill. The machine room will be extended eastward to accommodate the new machine.

Remaining improvements will be made at the Consolidated mill at Biron, Wis. The No. 3 machine will be rebuilt with a coating unit so as to be converted over from newsprint to book grades. A second pipe line will be built between the Wisconsin Rapids and Biron mills to take care of the larger sulphite pulp supply needed. The company has been pumping its pulp through one pulp line to Biron for years.

Work will be done under the Consolidated company's supervision with its own engineers in charge. About two hundred men will be employed in the building and improvement operations.

Dam Started on Old Tomahawk Site

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 17, 1937—Construction has been started by the C. R. Meyer Construction Company, of Oshkosh, Wis., on the new $500,000 dam for the Wisconsin Public Service Company on the Wisconsin River at Tomahawk, Wis. It will be on the site of the obsolete dam of the former Tomahawk Pulp and Paper Company.

The dam will be 732 feet long. A 70-foot section on the west side of the channel will be joined to a new power station, where two of the latest type water wheel generators will be installed. Extending from this building will be the reinforced concrete gate section, 412 feet long, containing five 31-foot and four 20-foot Tainter gates. An earth dam beyond this, extending to the east side of the channel, will be 250 feet long.

As soon as the work is far enough advanced, the old dam will be completely dismantled. The water level will then be raised two feet from its present level, maintained low because of the unsafe condition of the dam, and the storage pond will be considerably widened.

A sub-station also will be erected to feed the high tension loop between Rhinelander and Wausau, Wis.

The Wisconsin Public Service Corporation is also building a 44,000-volt transmission line from the Alexander dam on the Wisconsin River north of Merrill, Wis., to the Ward Paper Company's mill at Merrill, a distance of three and a half miles. The paper mill started operations recently, after its purchase from the Grandfather Falls Paper Company. A sub-station is to be built at the mill to step the voltage to 460 for use in operating the plant.

Ley Will Build Lee Plant Wing

Fred T. Ley & Co., Inc., has been awarded the contract for the erection of a brick and steel building for the Smith Paper Company in Lee. This building, 270 feet long, will have an average width of 150 feet and will be equipped with the most modern machines available and used for a finishing room.

One half of the building will consist of one story and basement and the other half will be one story with no basement. Work will start Monday and will require six months to complete. No figures are available as to the cost of the proposed work.

General Construction News

Glens Falls, N. Y. —The Imperial Paper and Color Corporation, Warren street, manufacturer of wall papers, operating the Imperial Wall Paper Company and other subsidiaries, has approved plans for new addition to local mill, to be one-story and basement, 60 x 120 feet, estimated to cost close to $55,000, including equipment. General erection contract has been let to the Kingsbury Construction Company, Main street, Hudson Falls, N. Y., and work will be placed under way soon.

Atlanta, Ga. — The Sloan Paper Company, 543-45 Whitehall street, S. W., paper products, has engaged J. R. Dillon and E. S. Lewis, Grant Building, Atlanta, architects, to prepare plans for proposed new one-story building for storage and distribution at Fair and Castleberry streets, where site has been acquired, as recently noted in these columns. New unit will ap-

proximate close to 20,000 square feet of floor space, and is reported to cost close to $75,000, including equipment. Bids will be asked for erection in near future. James L. Wells is president.

Winchester, Va. — Negotiations are reported under way for the acquisition of the former local mill of the Shenandoah Paper Board Company, Inc., now held by the Eddy Paper Corporation. Purchasing company, whose name is temporarily withheld, proposes to remodel and improve the plant, and will resume operations at early date.

Emeryville, Cal. — The Paraffine Companies, Inc., 475 Brannan street, San Francisco, Cal., manufacturer of building and roofing papers, etc., has plans nearing completion for new addition to mill at Emeryville, to be four-story and basement, located at the foot of Powell street. New unit is reported to cost over $85,000, with equipment. Bids are scheduled to be asked soon on general contract. Louis S. Rosener, 233 Sansome street, San Francisco, is architect and engineer.

Chelsea, Mass.—The Standard Box Company, 28 Gerrish avenue, manufacturer of folding paper boxes and containers, will build a one-story addition to plant, in addition to general improvements in present factory, recently referred to in these columns. Foundations for new unit are under way. Award for structural steel framing has been let to the Consolidated Iron Works, Commercial street, Malden, Mass., and for roofing to the Commonwealth Roofing Company, 47 Pearl street, Brookline, Mass. M. Slotnik, 333 Washington street, Boston, is general contractor. Sumner Schein, last noted address, is architect.

New York, N. Y.—Bulkley, Dunton & Co., 295 Madison avenue, New York, paper products, has arranged for lease of entire building at 30-32 Varick street, and for a floor in building at 11-17 Beach street, and will occupy for storage and distributing service for paper and pulp products.

New Haven, Conn.—The New Haven Pulp and Board Company, East street, manufacturer of paper board products, manila papers, etc., has awarded general contract to the H. Wales Lines Company, Meriden, Conn., for new addition to power house at mill, to be two-story, 60 x 60 feet. Additional boiler unit and auxiliary equipment will be installed for increased capacity. Structural steel framing will be furnished by the Berlin Construction Company, Kensington, Conn. Frederick L. Smith, 21 East Fortieth street, New York, N. Y., is architect and engineer.

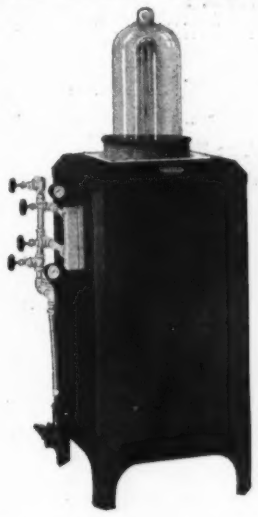
Charleston, S. C.—The General Asbestos & Rubber Company, North Charles street, manufacturer of rubber specialties for mill service, is considering construction of new one-story addition to mill, to be used primarily for the production of rubber rollers for use in paper mills. Ernest H. Jeffords is manager.

Toronto, Ont.—The National Cellulose Company of Canada, Ltd., Weston road and Clouston avenue, manufacturer of cellulose products, has begun construction of new addition to local mill, totaling about 7,000 square feet of floor space, and will use for expansion. New structure is reported to cost close to $30,000, with equipment.

Bury, England—Paper Tubes, Ltd., Foundry street, manufacturer of paper tubing and allied paper products, has plans under way for a new plant unit on local site, to be one-story, equipped for large increase in present capacity. It is estimated to cost over $300,000, with equipment.

Everson DeLuxe Chlorinator

The DeLuxe Model Chlorinator with a bell jar covered rotameter assembly mounted on top of black crinkled enameled cabinet is manufactured by the



Everson Manufacturing Company, of Chicago, Ill. The type of chlorinator illustrated is capable of delivering from one pound to 350 pounds of chlorine gas in 24 hours. In addition, the company manufactures chlorinators with capacities up to 1,000 pounds, metered to an accuracy of one per cent. Floor space of the cabinet is 24 inches wide, 20 inches deep, 60 inches high.

Perfects Anticipating Device

The Bristol Company, Waterbury, Conn., has perfected a device known as the B-Linator for use with automatic pyrometer controllers such as are used on industrial heating furnaces. The purpose of this device is to enable the pyrometer controller to anticipate temperature changes and correct the fuel consumption long enough in advance to prevent the temperature from cycling or rising above and falling below the control point as it does because of the thermal inertia offered by the mass of the furnace and the load.

The B-Linator can be used with practically all of the commonly used types of pyrometer controllers and can be added to present installations as well as incorporated in the control circuit of new equipment. It has the ability to anticipate temperature change trends, and thus enables the control equipment to smooth out the usual wavy control record to a straight line.

The B-Linator through a switching device adds or subtracts an emf to the regular thermocouple circuit to cause the controller to act in anticipation of a temperature change. The auxiliary emf is derived from thermocouples in the B-Linator case connected in series but opposing each other. The magnitude of the emf produced by these thermocouples is dependent on the temperature change trends.

The varying emf produced by the B-Linator annexes the anticipating feature of the control apparatus, enabling it to maintain a close temperature in the furnace.

CONGRESSIONAL COMMITTEE OPENS PAPER BIDS

(Continued from page 15)

120; flat, cut 25x38, 33x43, and 38x48 ins.

Fitchburg Paper Co.	6.42c
John F. Post, Inc.	6.16c
Walker, Goulard Plehn Co.	6.42c
R. P. Andrews Paper Co.	6.17c
Stanford Paper Co.	6.17c
Aetna Paper Co.	9.00c
Paper Corp. of U. S.	6.16c
Barton, Duer & Koch Paper Co.	6.17c

Lightweight Machine-Finish Book

No. 18—25,000 lbs., 25x38—60; flat, cut 32x48 and 38x48 ins.

No bids.

50 Per Cent Rag Lightweight High Machine-Finish Book

No. 19—40,000 lbs., 25x38—60; flat, cut 32x48 and 38x48 ins.

Whitaker Paper Co.	14.77c

50 Per Cent Rag Antique Book

No. 20—80,000 lbs., 25x38—80; flat, cut 32x48 and 38x48 ins.

Whitaker Paper Co.	13.68c
R. P. Andrews Paper Co.	13.97c
Aetna Paper Co.	9.888c

No. 21—70,000 lbs., 25x38—80; flat, cut 22¾x31½, 29x41 and 31½x45½ ins.

Whitaker Paper Co.	13.68c
R. P. Andrews Paper Co.	13.97c
Aetna Paper Co.	9.888c

No. 22—60,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 42 ins.

Whitaker Paper Co.	13.02c
R. P. Andrews Paper Co.	13.48c
Aetna Paper Co.	9.888c

75 Per Cent Rag Laid Antique Book

No. 23—15,000 lbs., 25x38—140; flat, cut 24x38 and 29x41 ins.; the laid marks to run the 24-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Whitaker Paper Co.	17.02c
R. P. Andrews Paper Co.	12.98c
Stanford Paper Co.	17.70c
Aetna Paper Co.	12.378c
Barton, Duer & Koch Paper Co.	13.25c

100 Per Cent Rag Antique Book

No. 24—5,000 lbs., 25x38—90; flat, cut 24x38 and 38x48 ins.; the grain to run lengthwise of the sheet. Min. order 5,000 lbs.

Whitaker Paper Co.	21.24c
R. P. Andrews Paper Co.	20.53c
Lee Paper Co.	19.32c
Mathers-Lamm Paper Co.	26.00c
Barton, Duer & Koch Paper Co.	16.75c

No. 25—20,000 lbs., 25x38—140; flat, cut 24x38 and 38x48 ins.; the grain to run lengthwise of the sheet; min. order 10,000 lbs.

Whitaker Paper Co.	21.24c
R. P. Andrews Paper Co.	20.53c
Lee Paper Co.	19.32c
Mathers-Lamm Paper Co.	26.00c
Stanford Paper Co.	20.37c
Barton, Duer & Koch Paper Co.	16.75c

Supercalendered Book

No. 26—40,000 lbs., 25x38—90; flat, cut 32x48 and 34x44 ins. Min. order 10,000 lbs.

Whitaker Paper Co.	6.60c
R. P. Andrews Paper Co.	6.52c
Champion Paper & Fiber Co.	6.60c
Stanford Paper Co.	6.62c

No. 27—250,000 lbs., 25x38—90; flat, cut 31¼x45½ ins.

Whitaker Paper Co.	6.47c
R. P. Andrews Paper Co.	6.51c
Champion Paper & Fiber Co.	6.47c
Stanford Paper Co.	6.47c

No. 28—500,000 lbs., 25x38—90; flat, cut 24x38 and 38x48 ins.

Whitaker Paper Co.	6.47c
R. P. Andrews Paper Co.	6.47c
Champion Paper & Fiber Co.	6.47c

No. 29—200,000 lbs., 25x38—90; rolls, 38 ins. wide (3-inch iron cores).

Whitaker Paper Co.	6.11c
R. P. Andrews Paper Co.	6.16c
Champion Paper & Fiber Co.	6.11c
Stanford Paper Co.	6.11c

No. 30—200,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch iron cores).

Perkins-Goodwin Co.	6.11c
Whitaker Paper Co.	6.16c
R. P. Andrews Paper Co.	6.15c
Dobler & Mudge	6.11c
Champion Paper & Fiber Co.	6.16c

Halftone Book

No. 34—300,000 lbs., 25x38—120 and 140; flat, cut 35x45, 38x48 and 38x51 ins.

R. P. Andrews Paper Co.	6.64c
Stanford Paper Co.	6.74c
Paper Corp. of U. S.	6.64c
Barton, Duer & Koch Paper Co.	6.79c

Single-Coated Book

No. 35—500,000 lbs., 25x38—140; flat, cut 25½x38, 29x41, 38x48, 38x51 and 41x52 ins.; the grain to run lengthwise of the sheet.

John F. Post, Inc.	7.71c
R. P. Andrews Paper Co.	7.30c
Stanford Paper Co.	7.61c

Double-Coated Book

No. 36—90,000 lbs., 25x38—140 and 160; flat, cut 24x32, 24x38 and 38x48 ins.; the grain to run lengthwise of the sheet.

John F. Post, Inc.	10.04c
R. P. Andrews Paper Co.	9.50c
Dobler & Mudge	9.50c
Stanford Paper Co.	9.94c

50 Per Cent Rag Double-Coated Book

No. 37—50,000 lbs., 25x38—140 and 160; flat, cut 24x32, 24x38, 32x42, 38x48, and 41x52 ins.; the grain to run lengthwise of the sheet.

R. P. Andrews Paper Co.	14.997c
Dobler & Mudge	15.50c
Stanford Paper Co.	15.50c

50 Per Cent Rag Machine-Finish Lithograph

No. 40—20,000 lbs., 25x38—160; flat, cut 26x38 ins.; the grain to run lengthwise of the sheet.

Whitaker Paper Co.	13.09c
R. P. Andrews Paper Co.	12.37c
Aetna Paper Co.	10.988c
Barton, Duer & Koch Paper Co.	12.47c

Mimeograph, White and Colored

No. 43—1,500,000 lbs., white, Nos. 40 and 48; flat, cut 24½x30½, 24½x32, 24½x38, 26x42½, and 28½x34½ ins.; the grain to run lengthwise of the sheet.

Aetna Paper Co.	9.00c
Paper Corp. of U. S.	6.20c
Barton, Duer & Koch Paper Co.	6.16c

No. 44—60,000 lbs., blue, buff, green, pink, and yellow, No. 40; flat, cut 24½x30½, 24½x32, 24½x38 and 26x42½ ins.; the grain to run lengthwise of the sheet. Min. order, one color, 10,000 lbs.

Aetna Paper Co.	10.00c
Barton, Duer & Koch Paper Co.	7.89c

25 Per Cent Rag Mimeograph

No. 47—2,000,000 lbs., Nos. 40 and 48; flat, cut 24½x30½, 24½x32, 24½x38, 26x42½, and 28½x34½ ins.; the grain to run lengthwise of the sheet.

Aetna Paper Co.	8.168c

Blue U S M O Safety Writing

No. 51—400,000 lbs., No. 32; rolls, 11 and 22 ins. wide, 24 ins. in diameter (3-inch iron cores).

R. P. Andrews Paper Co.	10.42c

U S M O Writing, White and Blue

No. 52—6,000 lbs., No. 32; rolls, 8½ inches wide, 24 ins. in diameter (3 inch iron cores). Min. order, either color, 4,000 lbs.

R. P. Andrews Paper Co.	9.75c

Safety Writing, Colored

No. 53—4,000 lbs., blue, gray, green, pink, salmon, and yellow, No. 40; flat, cut 17x28, 21x32, and 22x34 ins. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co.	12.95c
Mathers-Lamm Paper Co.	12.75c

Sulphite Writing, White and Colored

No. 55—1,500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

Aetna Paper Co.	8.00c
Paper Corp. of U. S.	6.50c

No. 56—2,500,000 lbs., white, Nos. 40 and 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Aetna Paper Co.	8.00c
Paper Corp. of U. S.	6.20c
Barton, Duer & Koch Paper Co., for 1,500,000 lbs., 6.20c; for 1,000,000 lbs. additional	6.45c

No. 57—40,000 lbs., white, No. 26; rolls, min. width 16 ins., max. width 38 ins. (3-inch iron cores).

Aetna Paper Co.	9.00c
Barton, Duer & Koch Paper Co.	7.59c

No. 58—400,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 38 ins. (3-inch iron cores).

Aetna Paper Co.	8.00c
Barton, Duer & Koch Paper Co.	6.26c

No. 59—100,000 lbs., white, Nos. 40 and 48; rolls, min. width 16 ins., max. width 38 ins. (3-inch iron cores).

Aetna Paper Co.	8.00c
Barton, Duer & Koch Paper Co.	6.26c

No. 60—40,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, 5,000 lbs.

Aetna Paper Co.	10.00c

No. 61—1,200,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, 10,000 lbs.

Stanford Paper Co.	7.17c
Aetna Paper Co.	9.00c

100 Per Cent Rag White Writing

No. 63—2,500 lbs., No. 56; flat, cut 21x32 ins. Min. order 2,500 lbs.

Old Dominion Paper Co.	25.98c
R. P. Andrews Paper Co.	23.80c
Lee Paper Co.	24.19c
Barton, Duer & Koch Paper Co.	24.95c

Lithograph-Finish Map

No. 64—15,000 lbs., Nos. 32 and 40; flat, cut 24x38, 30x40, 32x48, 36x52, and

38x48 ins. Min. order, one substance, 5,000 lbs.

No bids.

50 Per Cent Rag Lithograph-Finish Map

No. 65—20,000 lbs., Nos. 40, 48 and 56; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Reese & Reese, Inc. 13.39c
R. P. Andrews Paper Co. 16.67c
Aetna Paper Co. 13.768c
Barton, Duer & Koch Paper Co. 12.68c

75 Per Cent Rag Lithograph-Finish Map

No. 66—100,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Reese & Reese, Inc. 15.61c
R. P. Andrews Paper Co. 18.73c
Barton, Duer & Koch Paper Co. 14.89c

No. 67—60,000 lbs., Nos. 48 and 56; flat, cut any size, min. width 30 ins., max. width 48 ins.; the grain to run lengthwise of the sheet. Min. order, one substance, 5,000 lbs.

Reese & Reese, Inc. 15.61c
R. P. Andrews Paper Co. 18.73c
Barton, Duer & Koch Paper Co. 14.89c

100 Per Cent Rag White Chart, Lithograph-Finish

No. 69—100,000 lbs., No. 96; flat, cut any size, min. width 22 ins., max. width 46 ins.; packed in cases of 1,000 sheets each; the grain to run lengthwise of the sheet unless otherwise specified.

Reese & Reese, Inc. 25.10c
R. P. Andrews Paper Co. 25.77c
Lee Paper Co. 24.16c

Sulphite Manifold, White and Colored

No. 70—120,000 lbs., white, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size.

Import Paper Co. 8.00c

No. 71—40,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Import Paper Co. 9.00c

50 Per Cent Rag Manifold, White and Colored

No. 73—50,000 lbs., white, No. 14; flat, cut 21x32, 22x34, 28x34 and 38x48 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

R. P. Andrews Paper Co. 19.74c

No. 74—500,000 lbs., white, No. 18; flat, cut 21x32, 22x34, 24x38 and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size.

Old Dominion Paper Co. 17.747c
J. R. Howarth Paper Co. 16.27c
R. P. Andrews Paper Co. 14.36c
Lee Paper Co. 14.39c

No. 75—20,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 14; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 3,000 lbs.

R. P. Andrews Paper Co. 20.91c

No. 76—160,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, 24x38 and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Old Dominion Paper Co. 17.998c
J. R. Howarth Paper Co. 17.57c
R. P. Andrews Paper Co. 15.06c
Lee Paper Co. 15.96c
Barton, Duer & Koch Paper Co. 17.00c

100 Per Cent Rag White Manifold

No. 78—5,000 lbs., white, No. 14; flat, cut 17x28, 19x24, 21x32, and 22x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

R. P. Andrews Paper Co. 33.00c
Barton, Duer & Koch Paper Co. 33.99c

No. 79—30,000 lbs., white, No. 18; flat, cut 17x28, 19x24, 21x32 and 22x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 5,000 lbs.

Old Dominion Paper Co. 29.487c
R. P. Andrews Paper Co. 26.00c
Lee Paper Co. 28.80c
Barton, Duer & Koch Paper Co. 28.84c

50 Per Cent Rag White Glazed Manifold

No. 83—100,000 lbs., No. 16; flat, cut 19x24 and 21x32 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order 20,000 lbs.

Old Dominion Paper Co. 17.747c
Barton, Duer & Koch Paper Co. 17.59c

Sulphite White Bond

No. 102—750,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 21 ins.; max. width 34 ins.

Stanford Paper Co. 6.45c
Aetna Paper Co. 9.00c
Barton, Duer & Koch Paper Co. 7.30c

25 Per Cent Rag Bond, White and Colored

No. 109—250,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co. 15.52c
Aetna Paper Co. 15.968c

No. 110—500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co. 12.61c
Aetna Paper Co. 10.468c

No. 111—900,000 lbs. white, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co. 12.61c
Aetna Paper Co. 9.268c

No. 112—900,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co. 12.61c
Aetna Paper Co. 8.968c

No. 113—400,000 lbs., white, No. 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Old Dominion Paper Co. 11.949c
R. P. Andrews Paper Co. 12.61c
Aetna Paper Co. 9.348c

No. 114—300,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, 5,000 lbs.

R. P. Andrews Paper Co., 16.52c; cherry 17.52c
Aetna Paper Co. 12.468c

No. 115—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co., 13.61c; cherry 14.61c
Aetna Paper Co. 10.188c

No. 116—200,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co., 13.61c; cherry 14.61c
Aetna Paper Co. 9.588c

No. 117—100,000 lbs., blue, buff, cherry, green, pink, salmon and yellow. No. 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

R. P. Andrews Paper Co., 13.61c; cherry 14.61c
Aetna Paper Co. 10.148c

50 Per Cent Rag Bond, White and Colored

No. 120—50,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins.

Graham Paper Co. 16.05c
R. P. Andrews Paper Co. 18.51c
Aetna Paper Co. 13.678c
Barton, Duer & Koch Paper Co. 13.43c

No. 121—550,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

Reese & Reese, Inc. 12.95c
R. P. Andrews Paper Co. 15.04c
Aetna Paper Co. 11.278c
Barton, Duer & Koch Paper Co. 12.40c

No. 122—25,000 lbs., white, No. 48; flat, cut any size, min. width 21 ins., max. width 34 ins.

Graham Paper Co. 13.10c
R. P. Andrews Paper Co. 15.04c
Aetna Paper Co. 11.778c
Barton, Duer & Koch Paper Co. 12.40c

No. 123—30,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, one substance, 2,500 lbs.

Graham Paper Co. 14.07c
R. P. Andrews Paper Co., 16.04c; cherry 17.044c
Aetna Paper Co. 12.478c
Barton, Duer & Koch Paper Co. 12.75c

75 Per Cent Rag White Bond

No. 125—2,500 lbs., No. 26; flat, cut any size, min. width 21 ins., max. width 32 ins. Min. order 2,500 lbs.

Old Dominion Paper Co. 22.47c
Graham Paper Co. 22.10c
Mathers-Lamm Paper Co. 25.00c

No. 126—2,500 lbs., Nos. 32, 40, and 48; flat, cut any size, min. width 21 ins., max. width 32 ins. Min. order, one substance, 2,500 lbs.

Old Dominion Paper Co. 19.48c
Graham Paper Co. 19.05c
Mathers-Lamm Paper Co. 21.00c

100 Per Cent Rag White Bond

No. 128—6,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order, one substance, 2,000 lbs.

Old Dominion Paper Co. 25.47c
Graham Paper Co. 23.80c
R. P. Andrews Paper Co. 23.80c
Barton, Duer & Koch Paper Co. 23.85c

No. 129—5,000 lbs., No. 48; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order 2,000 lbs.

Old Dominion Paper Co. 25.36c
Graham Paper Co. 23.80c
R. P. Andrews Paper Co. 23.80c
Barton, Duer & Koch Paper Co. 23.85c

100 Per Cent Rag Declaration Bond

No. 140—3,000 lbs., Nos. 32 and 40; flat, cut 17x22 and 22x25½ ins. Min. order, one substance, 3,000 lbs.

Old Dominion Paper Co. 27.98c

100 Per Cent Rag Parchment Deed

No. 141—2,000 lbs., No. 64; flat, cut 33x34 ins. Min. order 2,000 lbs.

Old Dominion Paper Co. 25.97c
R. P. Andrews Paper Co. 23.80c
Barton, Duer & Koch Paper Co. 25.98c

Sulphite White Ledger

No. 151—100,000 lbs., white, Nos. 56 and 64; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order, one substance, 10,000 lbs.

George La Monte & Son 10.70c

Stanford Paper Co. 7.51c
Aetna Paper Co. 9.00c

No. 152—10,000 lbs., white, No. 80; flat, cut any size, min. width 17 ins., max. width 32 ins. Min. order 10,000 lbs.

Stanford Paper Co. 7.51c
Aetna Paper Co. 9.00c

25 Per Cent Rag Ledger, White and Colored

No. 154—60,000 lbs., white, Nos. 48 and 56; flat, cut 20x28, 21x32, 24x38, 28x29 and 28x34 ins. Min. order, one substance, 5,000 lbs.

Graham Paper Co. 13.50c
J. R. Howarth Paper Co. 12.015c
Stanford Paper Co. 12.80c
Aetna Paper Co. 10.378c
Paper Corp. of U. S. 11.66c
Barton, Duer & Koch Paper Co. 10.70c

No. 155—5,000 lbs., white, No. 64; flat, cut 21x32 and 23x36 ins. Min. order, 5,000 lbs.

J. R. Howarth Paper Co. 12.015c
Stanford Paper Co. 12.80c
Aetna Paper Co. 11.378c
Paper Corp. of U. S. 11.66c
Barton, Duer & Koch Paper Co. 11.70c

No. 156—10,000 lbs., white, No. 72; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order 5,000 lbs.

J. R. Howarth Paper Co. 12.015c
Stanford Paper Co. 12.80c
Aetna Paper Co. 11.378c
Paper Corp. of U. S. 11.66c
Barton, Duer & Koch Paper Co. 11.70c

No. 157—15,000 lbs., blue, buff, green, pink, salmon and yellow, Nos. 56, 64, and 72; flat, cut 21x32, 23x36, 24x38, 26x36, and 28x34 ins. Min. order, one substance, one color, 3,000 lbs.

Graham Paper Co. 14.25c
J. R. Howarth Paper Co. 13.015c
Stanford Paper Co. 13.30c
Aetna Paper Co. 11.978c
Barton, Duer & Koch Paper Co. 12.95c

50 Per Cent Rag Ledger, White and Colored

No. 160—100,000 lbs., white, Nos. 48 and 56; flat cut 18½x36, 18½x40¼, 20x28, 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 10,000 lbs

Old Dominion Paper Co. 13.177c
Graham Paper Co. 14.07c
J. R. Howarth Paper Co. 14.75c
Aetna Paper Co. 11.288c
Barton, Duer & Koch Paper Co. 12.25c

No. 161—30,000 lbs., white, No. 64; flat, cut 21x32 and 23x36 ins. Min. order 10,000 lbs.

Graham Paper Co. 14.07c
J. R. Howarth Paper Co. 14.75c
Aetna Paper Co. 11.388c
Barton, Duer & Koch Paper Co. 12.25c

No. 162—300,000 lbs., white, Nos. 72 and 80; flat, cut 20x28, 21x32, 24x38, and 28x34 and 36½x48½ ins. Min. order 10,000 lbs.

Old Dominion Paper Co. 13.177c
J. R. Howarth Paper Co. 14.75c
Aetna Paper Co. 12.988c
Barton, Duer & Koch Paper Co. 11.39c

No. 163—25,000 lbs., white, No. 88; flat, cut 21x32½ ins. Min. order 10,000 lbs.

J. R. Howarth Paper Co. 14.75c
Aetna Paper Co. 11.288c
Barton, Duer & Koch Paper Co. 12.25c

No. 164—80,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 56, 64, and 72; flat, cut 18½x36, 18½x40¼, 19x24, 21x32, 23x36, and 28x34 ins. Min. order, one substance, one color, 5,000 lbs.

Graham Paper Co. 14.40c
J. R. Howarth Paper Co. 15.75c
Aetna Paper Co. 11.888c
Barton, Duer & Koch Paper Co. 12.95c

No. 165—50,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, No. 88; flat, cut 21x32½ ins. Min. order, one color, 5,000 lbs.

Graham Paper Co. 14.40c
J. R. Howarth Paper Co. 15.75c
Aetna Paper Co. 11.988c
Barton, Duer & Koch Paper Co. 12.95c

75 Per Cent Rag Ledger, White and Colored

No. 168—10,000 lbs., white, Nos. 48 and 56; flat, cut 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 5,000 lbs.

Old Dominion Paper Co. 17.463c
Graham Paper Co. 18.06c
J. R. Howarth Paper Co. 17.25c
R. P. Andrews Paper Co. 17.38c
Virginia Paper Co. 19.79c
Barton, Duer & Koch Paper Co. 15.39c

No. 169—10,000 lbs., white, No. 64; flat, cut 21x32, 23x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Old Dominion Paper Co. 17.463c
Graham Paper Co. 18.06c
J. R. Howarth Paper Co. 17.25c
R. P. Andrews Paper Co. 17.38c
Virginia Paper Co. 19.79c
Barton, Duer & Koch Paper Co. 15.39c

No. 170—20,000 lbs., white, Nos. 72 and 80; flat, cut 20x28, 21x32, 24x38, and 28x34 ins. Min. order, one substance, 5,000 lbs.

Old Dominion Paper Co. 17.463c
Graham Paper Co. 18.06c
J. R. Howarth Paper Co. 17.25c
R. P. Andrews Paper Co. 17.38c
Virginia Paper Co. 19.79c
Barton, Duer & Koch Paper Co. 15.39c

No. 171—5,000 lbs., white, No. 88; flat cut 21x32½ ins. Min. order 5,000 lbs.

Old Dominion Paper Co. 17.463c
Graham Paper Co. 18.06c
J. R. Howarth Paper Co. 17.25c
R. P. Andrews Paper Co. 17.38c
Virginia Paper Co. 19.79c
Barton, Duer & Koch Paper Co. 15.39c

No. 172—10,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 56, 64, and 72; flat, cut 21x32, 23x36, 24x38, and 28x34 ins. Min. order, one substance, one color, 3,000 lbs.

Graham Paper Co. 18.56c
J. R. Howarth Paper Co. 18.25c
R. P. Andrews Paper Co. 18.08c
Virginia Paper Co. 20.78c
Barton, Duer & Koch Paper Co. 15.89c

No. 173—6,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, No. 88; flat, cut 21x32½ ins. Min. order, one color, 4,000 lbs.

Graham Paper Co. 18.56c
J. R. Howarth Paper Co. 18.25c
R. P. Andrews Paper Co. 18.08c
Virginia Paper Co. 20.78c
Barton, Duer & Koch Paper Co. 16.39c

100 Per Cent Rag White Ledger

No. 176—5,000 lbs., No. 48; flat, cut 21x32; 22¾x21½, 23x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Old Dominion Paper Co. 24.687c
Graham Paper Co. 22.92c
R. P. Andrews Paper Co. 22.92c
Mathers-Lamm Paper Co. 24.80c
Barton, Duer & Koch Paper Co. 23.33c

No. 177—10,000 lbs., No. 56; flat, cut 20x28, 21x32, 23x36, 24x38, and 28x34 ins. Min. order 5,000 lbs.

Old Dominion Paper Co. 24.687c
Graham Paper Co. 22.92c
R. P. Andrews Paper Co. 22.92c
Mathers-Lamm Paper Co. 24.80c
Barton, Duer & Koch Paper Co. 23.33c

No. 178—15,000 lbs., No. 64; flat, cut 18½x42, 21x32, 23x36, and 28x34 ins. Min. order 5,000 lbs.

Old Domonion Paper Co. 24.687c
Graham Paper Co. 22.92c
R. P. Andrews Paper Co. 22.92c
Mathers-Lamm Paper Co. 24.80c
Barton, Duer & Koch Paper Co. 23.33c

No. 179—5,000 lbs., No. 72; flat, cut 20x28, 21x32, 24x38 and 28x34 ins. Min. order, 5,000 lbs.

Old Dominion Paper Co. 24.687c
Graham Paper Co. 22.92c
R. P. Andrews Paper Co. 22.92c
Mathers-Lamm Paper Co. 24.80c
Barton, Duer & Koch Paper Co. 23.33c

No. 180—5,000 lbs., No. 80; flat, cut 21x32½ and 21x42 ins. Min. order 4,000 lbs.

Old Dominion Paper Co. 24.687c
R. P. Andrews Paper Co. 22.92c
Mathers-Lamm Paper Co. 24.80c
Barton, Duer & Koch Paper Co. 23.33c

No. 181—10,000 lbs., No. 88; flat, cut 20½x24¾, 21x32½, and 22¾x31½ ins. Min. order, 5,000 lbs.

Old Dominion Paper Co. 24.687c
R. P. Andrews Paper Co. 22.92c
Mathers-Lamm Paper Co. 24.80c
Barton, Duer & Koch Paper Co. 23.33c

Sulphite White Index

No. 184—250,000 lbs., white, 22½x28½—182 and 230; flat, cut 21x32½, 22½x28½, and 24½x32½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Old Dominion Paper Co. 7.274c
Stanford Paper Co. 6.36c

50 Per Cent Rag Index, White and Colored

No. 190—300,000 lbs., white, 22½x28½—182 and 230; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

J. R. Howarth Paper Co. 14.75c
Marquette Paper Co. 12.98c
Stanford Paper Co. 14.08c
Aetna Paper Co. 11.788c

No. 191—40,000 lbs., white, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 5,000 lbs.

J. R. Howarth Paper Co. 14.75c

No. 192—180,000 lbs., blue, buff, fawn, green, pink, salmon and yellow, 22½x28½—182 and 230; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Graham Paper Co. 13.10c
J. R. Howarth Paper Co. 15.75c
Marquette Paper Co. 12.98c
Stanford Paper Co. 15.08c
Aetna Paper Co. 11.388c

No. 193—20,000 lbs., blue, buff, fawn, green, pink, salmon and yellow, 22½x28½—280 and 362; flat, cut 21x32½ and 22½x28½ ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

J. R. Howarth aPper Co. 15.75c

100 Per Cent Rag White Index

No. 196—80,000 lbs., 22½x28½—approximately 206; flat, cut 20½x30½ and 21x32½ ins.

R. P. Andrews Paper Co. 22.92c
Marquette Paper Co. 23.94c

White Tissue

No. 197—2,000 lbs., flat, 21x32—18. Min. order 1,000 lbs.

Mathers-Lamm Paper Co. 11.82c

Facing Stereo Tissue

No. 198—500 lbs., 19x24—9; rolls 24 ins. wide (3-inch iron cores). Min. order 500 lbs.

No bids.

Coated Cover, White and Colored

No. 201—5,000 lbs., white, 20x26—130 and 160; flat, 26½x41 ins., the grain to run

lengthwise of the sheet. Min. order 5,000 lbs.

R. P. Andrews Paper Co. 7.60c
Dobler & Mudge 7.60c

No. 202—50,000 lbs., India tint and light green, 20x26—100; flat, 26½x41 ins.

R. P. Andrews Paper Co. 8.30c
Dobler & Mudge 8.30c

25 Per Cent Rag Machine-Finish Cover, White and Colored

No. 203—60,000 lbs., white, dawn, quaker drab, robin's egg, terra cotta, light blue, dark blue, buff, gold, cream, light gray, dark gray, light brown, dark brown, light green, dark green, and coral red; flat, 20x25—96, in wrapped bundles with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,500 lbs.

Whitaker Paper Co. 12.16c
J. R. Howarth Paper Co. 12.00c
R. P. Andrews Paper Co. 10.93c
Stanford Paper Co. 11.64c

No. 204—80,000 lbs., white, blue, brown, granite, green, pink, tea and yellow, 20x26—100; flat, cut 20x25 and 33x46 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

Whitaker Paper Co. 12.16c
J. R. Howarth Paper Co. 11.75c
R. P. Andrews Paper Co. 10.93c

50 Per Cent Rag Laid Cover, Colored

No. 205—60,000 lbs., blue, cream, white, gray and green, 20x26—130; flat, cut 20x25, 22x33 and 26½x41 ins., in wrapped bundles, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

J. R. Howarth Paper Co. 14.24c
R. P. Andrews Paper Co. 12.67c
Lee Paper Co. 12.21c
Barton, Duer & Koch Paper Co. 13.45c

Wood Manila

No. 209—150,000 lbs., 24x36—80 to 120; flat, cut 21x32, 22½x34½, and 25x38 ins., in wrapped bundles with projecting colored-paper marker between each 500 sheets.

Paper Corp. of U. S. 5.69c
Barton, Duer & Koch Paper Co. 3.98c

No. 210—200,000 lbs., 24x36—80 to 120; rolls, 18 and 21 ins. wide (3-inch iron cores).

Paper Corp. of U. S. 5.40c
Barton, Duer & Koch Paper Co. 4.38c

Chemical Wood Manila

No. 211—20,000 lbs., 24x36—100 to 160; flat, cut any size in wrapped bundles. Min. order, one weight, 5,000 lbs.

Barton, Duer & Koch Paper Co. 5.75c

Rope or Super-Purified Wood Manila

No. 213—10,000 lbs., 24x36—120, 140, and 160; rolls, 18 and 48 ins. wide (3-inch iron cores). Min. order 5,000 lbs.

No bids.

No. 214—10,000 lbs., 24x36—280; rolls, 48 ins. wide (3-inch iron cores). Min. order 5,000 lbs.

No bids.

Drumhead Manila

No. 215—30,000 lbs., 24x36—280; flat, cut 26x42 ins. Min. order 5,000 lbs.

Whitaker Paper Co., 8.33c; min., 10,000 lbs. 8.08c
Barton, Duer & Koch Paper Co. 11.00c

No. 2 Kraft

No. 217—160,000 lbs., 24x36—80 to 160; flat, cut any size in wrapped bundles.

No bids.

No. 218—120,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles.

No bids.

No. 219—250,000 lbs., 24x36—80 to 160; rolls, 9, 10½, 11½, 24, 36, 39, and 48 ins. wide, wound on wooden plugs, 1½-inch hole, or in 3-inch iron cores as may be specified.

No bids.

No. 1 Kraft

No. 220—6,000 lbs., 24x36—120 and 160; flat, cut any size in wrapped bundles.

No bids.

White Paraffin

No. 251—1,000 lbs., flat, 24x38—32. Min. order 1,000 lbs.

Old Dominion Paper Co. 11.99c
J. R. Howarth Paper Co. 11.49c
R. P. Andrews Paper Co. 10.67c
Mathers-Lamm Paper Co. 12.10c

White Gummed

No. 252—400,000 sheets, flat, 17x22—40, exclusive of weight of gum used. Min. order 50,000 sheets.

Old Dominion Paper Co. .. $5.458 per M sheets
Walker, Goulard Plehn Co. 6.18 per M sheets
R. P. Andrews Paper Co. .. 4.60 per M sheets
Virginia Paper Co. ..... 5.426 per M sheets
Stanford Paper Co. ..... 5.50 per M sheets
Barton, Duer & Koch Paper Co. .. 6.00 per M sheets

Blotting, White and Colored

No. 254—10,000 lbs., white, flat, 19x24—160, in wrapped bundles. Min. order 4,000 lbs.

L. Hyman & Sons 8.00c
Old Dominion Paper Co. 5.888c
Walker, Goulard Plehn Co. 6.74c
J. R. Howarth Paper Co. 6.75c
R. P. Andrews Paper Co. 6.97c
Barton, Duer & Koch Paper Co. 5.85c

No. 255—2,000 lbs. buff and salmon, flat, 19x24—160, in wrapped bundles. Min. order 2,000 lbs.

L. Hyman & Sons 8.50c
Old Dominion Paper Co. 5.89c
Walker, Goulard Plehn Co. 6.74c
J. R. Howarth Paper Co. 7.25c
R. P. Andrews Paper Co. 6.97c
Barton, Duer & Koch Paper Co. 5.85c

25 Per Cent Rag Blotting, White and Colored

No. 256—15,000 lbs., white, flat, 19x24—160, in wrapped bundles. Min. order 10,000 lbs.

L. Hyman & Sons 10.50c
Old Dominion Paper Co. 7.199c
Walker, Goulard Plehn Co. 8.74c
R. P. Andrews Paper Co. 7.47c
Barton, Duer & Koch Paper Co. 7.17c

No. 257—4,000 lbs., buff and salmon, flat, 19x24—160, in wrapped bundles. Min. order one color, 2,000 lbs.

L. Hyman & Sons 11.00c
Old Dominion Paper Co. 7.33c
Walker, Goulard Plehn Co. 8.74c
R. P. Andrews Paper Co. 7.47c
Barton, Duer & Koch Paper Co. 7.29c

Desk Blotting, Colored

No. 258—5,000 lbs. blue and buff, flat, 19x24—200, in wrapped bundles. Min. order, one color, 5,000 lbs.

L. Hyman & Sons 8.50c
Old Dominion Paper Co. 5.89c
Walker, Goulard Plehn Co. 6.49c
J. R. Howarth Paper Co. 7.25c
R. P. Andrews Paper Co. 6.19c
Barton, Duer & Koch Paper Co. 5.85c

No. 259—60,000 lbs., moss-green, flat, 19-24—200, in wrapped bundles. Min. order 10,000 lbs.

L. Hyman & Sons 8.00c
Old Dominion Paper Co. 5.877c
Walker, Goulard Plehn Co. 6.73c
J. R. Howarth Paper Co., 7.20; (Carload lots of 36,000 lbs.) 6.98c
R. P. Andrews Paper Co. 5.59c
Barton, Duer & Koch Paper Co. 5.83c

White Stereotype Molding

No. 260—1,500 lbs., 19x24—120; rolls, 24 ins. wide (3-inch iron cores). Min. order, 1,000 lbs.

L. Hyman & Sons 11.50c

Red Stereotype Molding

No. 261—1,000 lbs., 19x24—40; rolls, 24 ins. wide (3 inch iron cores). Min. order 1,000 lbs.

L. Hyman & Sons 11.50c

Oiled Manila Tympan

No. 262—20,000 lbs., 24x36—approximately 200; rolls, 38 and 48 ins. wide; 10-inch diameter; wound on wooden plugs, 1½-inch hole. Min. order 5,000 lbs.

Mathers-Lamm Paper Co. 7.08c
Link Paper Co. 7.00c

Plate-Wiping, for Embossing Presses

No. 263—2,000 lbs., 24x36—100; rolls, 24 ins. wide (3-inch iron cores). Min. order 1,000 lbs.

Barton, Duer & Koch Paper Co. 7.00c

Back-Lining, for Case-Making Machines

No. 264—2,000 lbs., 24x36—180; rolls, 24 ins. diameter, 37 ins. wide (3-inch iron cores). Min. order 2,000 lbs.

R. P. Andrews Paper Co. 3.87c
Mathers-Lamm Paper Co. 3.67c

High-Finish Red Sulphite

No. 265—10,000 lbs., flat, 24x36—320 and 400, in wrapped bundles. Min. order 5,000 lbs.

No bids.

High-Finish Sulphite Manila Tag

No. 271—90,000 lbs., 24x36—160 to 280; flat, cut any size, min. width 24 ins., max. width 38 ins., in wrapped bundles.

No bids.

Calendered Tag, Manila and Colored

No. 276—1,000,000 lbs., manila, 22½x28½—approximately 148; rolls, 23¼ and 26½ ins. wide (6-inch iron cores).

Fitchburg Paper Co. 7.00c
Stanford Paper Co. 7.00c
Barton, Duer & Koch Paper Co. 7.00c

No. 277—60,000 lbs., blue, brown, green, pink, red, salmon and yellow, 22½x28½—approximately 148; rolls, 23¼ and 26½ ins. wide (6-inch iron cores). Min. order, one color, 10,000 lbs.

Barton, Duer & Koch Paper Co. 7.75c

Jute or Super-Purified Wood Tag

No. 280—30,000 lbs., 22½x28½—200 and 280; flat, cut 22½x28½ ins., in wrapped bundles. Min. order, one weight, 10,000 lbs.

Whitaker Paper Co. 8.08c

Manila Board

No. 281—20,000 lbs., 22½x28½—400; flat, cut 17x28, 21x32, and 22½x28½ ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets. Min. order 10,000 lbs.

No bids.

Railroad Board, White and Colored

No. 302—70,000 sheets, white, flat, 22x28 ins., 4-ply, each 100 sheets fully banded, packed in wooden cases. Min. order 10,000 sheets.

L. Hyman & Sons ..... $24.48 per M sheets
Old Dominion Paper Co. ..... 24.688 per M sheets

Walker, Goulard Plehn Co...	24.73	per M sheets
Dobler & Mudge	24.44	per M sheets
Virginia Paper Co.	24.47	per M sheets
Stanford Paper Co.	22.50	per M sheets
Barton, Duer & Koch Paper Co.	24.20	per M sheets

No. 303—15,000 sheets, white, flat, 22x28 in., 8-ply, each 100 sheets fully banded, packed in wooden cases. Min. order 5,000 sheets.

L. Hyman & Sons	$35.00	per M sheets
Old Dominion Paper Co....	35.367	per M sheets
Walker, Goulard Plehn Co...	35.40	per M sheets
Dobler & Mudge	34.99	per M sheets
Virginia Paper Co.	35.03	per M sheets
Stanford Paper Co.	35.25	per M sheets
Barton, Duer & Koch Paper Co.	34.65	per M sheets

No. 304—30,000 sheets, white, flat, 22x28 ins., 14-ply, each 50 sheets fully banded, packed in wooden cases. Min. order 5,000 sheets.

L. Hyman & Sons	$49.99	per M sheets
Old Dominion Paper Co....	50.379	per M sheets
Walker, Goulard Plehn Co...	50.44	per M sheets
Dobler & Mudge	49.83	per M sheets
Virginia Paper Co.	49.90	per M sheets
Stanford Paper Co.	46.50	per M sheets
Barton, Duer & Koch Paper Co.	45.70	per M sheets

No. 305—50,000 sheets, ash gray, blue, buff, green, lemon and orange, flat, 22x28 ins., 4-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, one color, 5,000 sheets.

L. Hyman & Sons	$30.30	per M sheets
Old Dominion Paper Co....	34.98	per M sheets
Walker, Goulard Plehn Co...	30.55	per M sheets
Dobler & Mudge	30.19	per M sheets
Virginia Paper Co.	30.23	per M sheets
Stanford Paper Co.	30.50	per M sheets
Barton, Duer & Koch Paper Co.	29.95	per M sheets

Wood Bristol, Colored

No. 306—150,000 lbs., buff, 22½x28½—150; rolls 22 ins. wide (6-inch iron cores).

Barton, Duer & Koch Paper Co..... 4.65c

No. 307—80,000 lbs., blue, buff, gray, green, melon, pink, quaker-drab, and yellow, flat, 21x31—204; in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Barton, Duer & Koch Paper Co..... 4.65c

No. 308—140,000 lbs., blue, brown, buff, gray, green, melon, pink and yellow, 22½x28½—200; rolls 20 ins. wide (6-inch iron cores).

Barton, Duer & Koch Paper Co..... 4.65c

No. 309—140,000 lbs., blue, brown, buff, gray, green, melon, pink and yellow, 22½x28½—200; rolls 20 ins. wide (6-inch iron cores).

Barton, Duer & Koch Paper Co..... 4.65c

No. 310—40,000 lbs., buff, 22½x28½—200; flat, cut 12x18 and 14½x17½ ins., the grain to run lengthwise of the sheet, in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Barton, Duer & Koch Paper Co..... 4.65c

United States Postal Card Bristol

No. 325—6,000,000 lbs., 22½x28½—188; rolls 33 ins. wide and 34 ins. in diameter (6-inch iron cores).

Whitaker Paper Co.	5.40c
R. P. Andrews Paper Co.	5.40c
Champion Paper & Fiber Co.	5.40c

Pressboard, Colored

No. 351—12,000 sheets, red, flat, 24x32 ins., thickness .0140 inch. Min. order 5,000 sheets.

Whitaker Paper Co.	$6.64	per 100 sheets
Walker, Goulard Plehn Co..	6.69	per 100 sheets
Mathers-Lamm Paper Co...	6.53	per 100 sheets
Barton, Duer & Koch Paper Co.	7.15	per 100 sheets

No. 352—7,000 sheets, gray, flat, 30x36 ins., thickness .0300 inch. Min. order 5,000 sheets.

Whitaker Paper Co.	$22.42	per 100 sheets
Old Dominion Paper Co...	12.99	per 100 sheets
Walker, Goulard Plehn Co..	20.31	per 100 sheets
Barton, Duer & Koch Paper Co.	21.75	per 100 sheets

News Board

No. 360—4,000 lbs., flat, 26x38 ins., No. 100 (to be trimmed square on four sides). Min. order 1,000 lbs.

Whitaker Paper Co.	2.475c
R. P. Andrews Paper Co.	2.50c
Dobler & Mudge	2.50c
Virginia Paper Co.	2.50c
Mathers-Lamm Paper Co.	24.75c
Stanford Paper Co.	2.45c
Barton, Duer & Koch Paper Co.	2.50c

Chip Board

No. 361—800,000 lbs., 26x38 ins., No. 50, flat, cut 21½x32½, 24½x38, 26x38, 28½x34½, and 32½x42½ ins.

L. Hyman & Sons	2.25c
Container Corp. of America	2.25c
Whitaker Paper Co.	2.1478c
Old Dominion Paper Co.	2.1753c
R. P. Andrews Paper Co.	2.17c
Dobler & Mudge	2.162c
Virginia Paper Co.	2.148c
Mathers-Lamm Paper Co.	2.30c
Stanford Paper Co.	2.20c
Barton, Duer & Koch Paper Co.	2.16c

Marble Grained Lined Board

No. 362—15,000 lbs., 26x38 ins., No. 50; flat, cut 22x32 ins.

Mathers-Lamm Paper Co. 4.5375c

Strawboard

No. 363—5,000 lbs., flat, 26x38 ins., No. 50.

No bids.

Lined Chip Board

No. 364—5,000 lbs., flat, 26x38 ins., No. 50.

Whitaker Paper Co.	3.069c
R. P. Andrews Paper Co.	3.10c
Dobler & Mudge	3.10c
Virginia Paper Co.	3.10c
Mathers-Lamm Paper Co.	2.97c
Stanford Paper Co.	3.038c
Barton, Duer & Koch Paper Co.	3.10c

Lined Box Board

No. 365—36,000 lbs., 26x38 ins., No. 40; flat, cut 24½x34 ins. Min. order 36,000 lbs.

Whitaker Paper Co.	2.638c
R. P. Andrews Paper Co.	2.67c
Dobler & Mudge	2.66c
Virginia Paper Co.	2.638c
Mathers-Lamm Paper Co.	2.66c
Stanford-Paper Co.	2.695c
Barton, Duer & Koch Paper Co.	2.63c

Binder's Board, No. 1 Quality

No. 366—230,000 lbs., flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30 and 40.

Mathers-Lamm Paper Co. 3.57c

No. 367—80,000 lbs., 25¾x30¾ ins., Nos. 12 and 20; flat, to trim 34x44 ins.

Mathers-Lamm Paper Co. 3.57c

Binder's Board, Best Quality

No. 368—40,000 lbs., flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45.

No bids.

H. G. Weber & Company Move

H. G. Weber & Co., formerly of Sheboygan, Wis., have moved to Kiel, Wis. The new quarters give the concern a complete machine shop with all modern equipment for the manufacture of modern bag machinery.

The increase in the company's business made the removal necessary and the company has just had to plan for increased space and is building an addition which will double the capacity.

Herbert Weber, formerly of Thomas M. Royal & Co., is now associated with his father, who is president of the H. G. Weber & Co. The company manufactures all styles and classes of bag machinery.

Motorpump Catalog

Ingersoll-Rand Company, 11 Broadway, New York, has just issued a new catalog describing its Cameron Motorpumps. These pumps are compact machines combining electric motor and centrifugal pumps in a single unit. Capacities range from 5 to 1000 gallons per min. for heads to 500 ft. Motor sizes range from ¼ to 40 hp.

New Lehigh Valley Catalog

The Lehigh Valley Paper House of Allentown, Pa., a division of S. Walter, Inc. of Philadelphia have issued a revised price list and catalog of fine papers.

The new catalog is of loose leaf design making it possible to make the necessary price changes on their lines and thereby keeping the catalog up to date at all times.

Hammermill's new green Dura-Glo cover was used for the cover, printed in red and black ink, tending to make very attractive cover.

The text pages are printed on Whiting Plover's green Artesian Bond in keeping with the division color scheme.

Recording Gauge Bulletins

Several new bulletins on recording and controlling gauges have just been published by The Bristol Company, Waterbury, Conn. These are bulletins No. 483, No. 484, No. 485, and No. 486. Copies will be sent to anyone interested in the subject of gauges.

Ontario Paper Mills Fairly Active

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 17, 1937—Although there has been a slight falling off in sales of paper during the past couple of weeks the wholesale paper trade in Ontario is in a satisfactory condition with demand being quite well sustained in all lines. Both the wholesalers and the mills are busy although it cannot be said that the coated paper market is as good as it has been during the early spring. Coated manufacturers report a slight diminution in demand but it is believed that the condition is only temporary and that the better class papers will soon be up equal with the higher grades. As it is there is a good call for book, offset and general lines of good grade stock which are moving nicely. There is also a good call for tag manillas, blanks and Canadian-made blotting paper and mills making these lines are busy. Paper converters are moderately busy with a good demand for the most part for envelopes and general stationery lines. Manufacturers of tissues and light weight papers generally are enjoying good business under a good demand for tissue specialty lines like towels and crepes. In glassine, greaseproof and waxing paper the mills report a well sustained demand and a considerably lessened competition from foreign markets which are busy supplying their own needs.

The coarse paper market is in a better condition than it has been for some time with a general disposition on the part of consumers to place larger orders and the same may be said of paper bags, including flour sacks. There is a pretty fair demand all round in the wrapping paper trade. Kraft mills are running full under a well sustained demand that promises to take in the spring and summer months. Jobbers and consumers are not just sure that present prices will continue to prevail and uncertainty as to whether kraft quotations are going to take a jump has caused a lot of buying which has kept the mills very busy. The paper box trade is fairly busy and the board mills are doing a satisfactory business.

Norwegian Paper Products

Edited by Emil Moestue a/s Oslo, with the assistance of the Norwegian Paper Makers' Association, "Norwegian Paper and Cardboard Mills and Samples of Their Products" is arranged in such a way that the products of each mill is shown collectively with detailed particulars of the plant.

The number of samples shown in the volume is abundant and affords a true exponent of the products of the Norwegian paper industry so that the book may be of daily use to buyers and sellers and also to all who may be interested in having a book of reference for the Norwegian paper and cardboard industry.

The price of the book is kr. 18.000 plus postage and it may be ordered from the publishers, Emil Moestue a/s Skippergaten, Oslo, Norway.

Joseph Quinn To Be Pulp Chemist

Joseph Quinn, 24 Ferry street, Hudson Falls, N. Y., has been accepted by the Joint Committee on Approved Pulp Testing Chemists for the paper industry, as an approved pulp and paper mill testing chemist, and is listed as such, effective May 10, 1937.

Shaw-box Crane & Hoist Co.

Two New Small Low Head Room Type Electric Hoists built in sizes to lift 350 and 700 pounds have just been placed on the market by Shaw-Box Crane and Hoist Company, Inc., of Muskegon, Mich., under the trade name "Load Lifter Junior."

They are replicas of the larger capacity low head room electric hoists manufactured by this firm. With them the distance from the bottom of the track on which the hoists operate to the hook when in its highest position is less than that of a chain hoist suspended from a trolley, it being only 12¾ inches.

These small hoists have a lifting speed of 20 feet per minute with rated capacity loads, and give a hook lift of 18 feet. Control is by push buttons contained in a unit suspended from the hoists. The hoists are comparatively light in weight, weighing only 185 pounds ready to operate, complete with trolley.

Mechanically they are of simple design. The gear train consists of only two gears and pinions. Ball bearings are employed at every bearing. The motor is of the totally enclosed ball bearing type. The hoists are equipped with two brakes, an electrically operated motor brake and an automatic mechanical load brake of the roller rachet type that controls the load during lowering so that the lowering speed is approximately the same as the hoisting speed.

In design the hoist is totally enclosed, all parts being built into the hoist frame. The gearing and mechanical load brake operate in an oil bath.

Red Book of Carload Storage

An attractive pictorial catalog of freight carloading stowage braced by Gerrard galvanized round wire strapping or metal ties that prevent damage to carloads of mixed merchandise, sewer pipes, sheet steel, and even glass milk bottles has just been published by the Gerard Company, Inc.

A special page is devoted to skid strapping of paper and illustrations are shown of newsprint and coated and enameled stock firmly strapped and stowed. Wire tying of paper pulp is now being strapped by the same method. Copies of this carloading book are free for the asking.

Bartlett Removes Office

The C. O. Bartlett & Snow Company, Cleveland, Ohio, announces the removal of its office in New York to Room 404-E at 30 Church street. The office continues in charge of C. W. Ross, district manager, who has represented the company's foundry, drying, conveying and coal and ash handling equipment, in that territory, for more than twelve years.

Joins Mathieson Alkali

The Mathieson Alkali Works announces the appointment to its New York office sales force of James R. Harrington, formerly with the Titanium Division of National Lead Company. Mr. Harrington, who received his chemical engineering training at Washington University in St. Louis, will cover the Metropolitan Area for Mathieson.

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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY—Fall Convention, DeSoto Hotel, Savannah, Ga., Oct. 18-20, 1937.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Meeting, Springfield, Mass., June 23-25.

EXPORTS AND IMPORTS HIGHER

Exports of paper and paper products from the United States during February reached a total value of $2,079,284, this amount representing an increase of 8 per cent over the January total and 23 per cent over the total recorded for February 1936. Nearly all items contributed to this increase, according to the Forest Products Division of the Department of Commerce.

A comparison of the February 1936 and February 1937 volume of shipments suggests a higher rise than indicated by the increase in total value between these respective months. Exports of wrapping paper, an important item in this schedule, were on an average 35 per cent higher in February than in January and 41 per cent higher than during the corresponding month last year. Shipments of paper bags were more than double those of February 1936 and were 56 per cent higher than in January.

In the fine paper group, exports of book and cover papers dropped off about 10 per cent compared with January but were respectively 114 per cent and 81 per cent higher than during the corresponding month last year. Shipments of writing paper were 37 per cent and shipments of bristols 26 per cent above January exports. Shipments of both were also well in excess of those for the corresponding month last year.

Exports of surface coated papers were 83 per cent above January shipments and 89 per cent above those recorded for February 1936. Newsprint paper exports rose 31 per cent as compared with the preceding month but were 73 per cent lower than the corresponding month last year.

Exports of boxboards, one of the largest items in the paper schedule, underwent a further decline during February, shipments falling nearly 14 per cent under the January level and 47 per cent below the figure recorded for February 1936. Exports of "other paperboard" were slightly higher and exports of boxes and cartons show a heavy increase, but these increases were insufficient to offset the losses in boxboards.

Exports of building papers and boards on the whole show an improvement in February. Shipments of sheathing and building papers were nearly double those of a year ago while insulating boards increased 40 per cent. The latter increase was offset to some extent by a decline in exports of wallboards.

Among the remaining items shipments of vulcanized fiber and cash register paper and paper towels and napkins during February exceeded both January and February 1936; tissue and crepe, toilet paper, blotting paper, and envelopes were larger in volume than during the corresponding month last year but failed to attain the level of the January shipments; exports of blotting paper were smaller than either of the other two months.

Exports of paper base stocks, valued at $648,640 were slightly under those recorded for January or for February 1936. This decline was due principally to a curtailment in exports of pulpwoods and unbleached sulphite pulp. Exports of pulpwood dropped off 58 per cent compared to January and 88 per cent compared to February 1936.

Shipments of unbleached sulphite were 67 per cent under those of the latter date although more than double the January figure. Exports of bleached sulphite, on the other hand, were nearly double those of February 1936 but were 11 per cent under the amount recorded for January.

Imports of paper into the United States during February were valued at $8,492,894, a decrease of 12 per cent compared with January but an increase of 32 per cent over February 1936. As usual, imports of newsprint make up between 85 per cent and 90 per cent of these receipts. Imports of the latter amounting to 204,689 tons valued at $7,457,339 during February were 14 per cent under the January receipts. At the same time they exceeded those of the corresponding month last year by 30 per cent in volume and 37 per cent in value.

The remaining imports consist largely of kraft wrapping, pulpboards in rolls, paper boards of various sorts, and cigarette papers. The aggregate value of these receipts came to $1,035,555, an increase of 3 per cent over both the preceding month and the corresponding month in 1936.

With few exceptions imports of paper base stocks during February were greater in both volume and value than during January or February 1936. Compared with the preceding month, pulpwood imports increased on an average 17 per cent and wood pulp and other base stocks 8 per cent. In comparison with the corresponding month last year, however, imports of pulpwood were greater by 43 per cent, imports of wood pulp by 33 per cent, and imports of rags and other waste for paper making by 30 per cent. The increase in value of the latter item, however, amounted to 76 per cent, due to the higher proportion of rags, compared with other waste.

With the exception of bleached sulphite pulp, receipts in all classes of wood pulp during February exceeded those of February 1936, the greatest increases occurring in unbleached sulphite and unbleached sulphate (kraft) pulps. Imports of mechanical pulp declined 16 per cent and imports of soda pulp 11 per cent compared with January. The total value of paper base stocks imported during February came to $8,944,177, an increase of 11 per cent over the amount recorded for January and 36 per cent over the total for February 1936.

Newsprint Output Advances

Production in Canada during April 1937 amounted to 298,347 tons and shipments to 310,614 tons according to the News Print Service Bureau. Production in the United States was 78,642 tons and shipments 84,992 tons, making a total United States and Canadian newsprint production of 376,989 tons and shipments of 395,606 tons. During April 30,793 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 407,782 tons. Total production in April 1936 was 360,416 tons.

The Canadian mills produced 211,294 tons more in the first four months of 1937 than in the first four months of 1936, which was an increase of twenty-two and two-tenths per cent. The output in the United States was 8,063 tons or two and six-tenths per cent more than in the first four months of 1936, and in Newfoundland 19,556 tons or nineteen and six-tenths per cent more, making a total increase of 238,913 tons, or seventeen and six-tenths per cent.

Stocks of newsprint paper at Canadian mills were reported at 72,223 tons at the end of April and 12,406 tons at United States mills, making a combined total of 84,629 tons compared with 103,246 tons on March 31, 1937. The opening of navigation made possible the shipment of considerable tonnage which had accumulated during the winter.

Norwalk Factory Sold

The property and plant formerly used by the St. George Paper Company at Norwalk, Conn., has been purchased by clients of Myers & Sherwin. The new owners have not revealed their plans for use of the property. The St. George company, the seller, is an affiliate of the International Paper and Power Company.

Production Ratio Report

The following statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	90.3% (c)	76.1%	65.8%	.....
February	90.1% (c)	77.9%	70.0%	.....
March	90.5% (c)	76.0%	70.5%	.....
April	91.4% (c)	82.3%	70.0%	.....
May	.....	81.6%	69.4%	.....
June	.....	80.7%	72.3%	.....
July	.....	77.3%	64.9%	.....
August	.....	81.5%	70.9%	.....
September	.....	80.5%	71.9%	58.2%
October	.....	87.6%	75.6%	64.7%
November	.....	88.0%	75.3%	61.7%
December	.....	85.9%	71.2%	59.6%
Year Average	.....	81.3%	70.5%	.....
Year to Date First 18 weeks	90.6% (c)	78.2%	68.9%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1937		CORRESPONDING WEEKS, 1936	
*Apr. 10	92.4% (c)	Apr. 11	82.9%
*Apr. 17	92.9% (c)	Apr. 18	82.0%
*Apr. 24	91.1% (c)	Apr. 25	83.1%
*May 1	90.6% (c)	May 2	83.4%
*May 8	89.9% (c)	May 9	81.4%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: 1937 April 10,	1937 April 17,	1937 April 24,	1937 May 1,	1937 May 8,
0% to 50%	42	36	37	42	26
51% to 100%	279	281	278	261	192
Total Mills Reporting	321	317	315	303	218

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported on January 4, 1937, Machine Improvement Survey.

Paperboard Operating Ratios

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1937 %	1936 %	1935 %	1934 %	Mos.	1937 %	1936 %	1935 %	1934 %
Jan.	80(e)	61	61	..	July	..	69	59	..
Feb.	86(e)	67	67	..	Aug.	..	75	63	..
Mar.	87(e)	68	67	..	Sept.	..	76	69	62
Apr.	..	70	61	..	Oct.	..	82	76	63
May	..	68	61	..	Nov.	..	79	70	56
June	..	68	65	..	Dec.	..	74	60	52

Week end. Apr. 10, 1937 87%
Week end. Apr. 17, 1937 88%
Week end. Apr. 24, 1937 89%
Week end. May 1, 1937.. 87%
Week end. May 8, 1937 87%

(e) Basic figures revised to include new members of the National Paperboard Association.

New Hurlbut Distributors

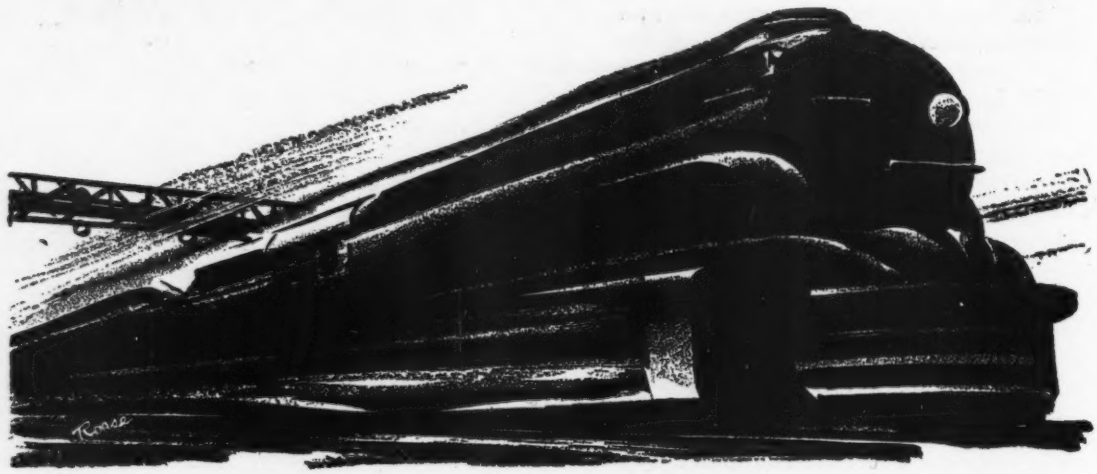
The following new distributors have been appointed by the Hurlbut Paper Company, of South Lee, Mass., for Mould Made Covers:—

Wilcox-Mosher-Leffholm Company, Minneapolis, Minn.; C. P. Lesh Paper Company, Indianapolis, Ind.; James White Paper Company, Chicago, Ill.; Midland Paper Company, Chicago, Ill.; Royal Paper Corporation, New York; Carpenter Paper Company of Oklahoma, Oklahoma City, Okla., and G. H. Buhrmann's, Amsterdam, Holland.

The following new distributors have been appointed for Cortlea:—

Wilcox-Mosher-Leffholm Company, Minneapolis, Minn.; Midland Paper Company, Chicago, Ill.; Charles A. Esty Paper Company, Worcester, Mass.; Royal Paper Corporation, New York, and Mill Brand Papers Inc., Springfield, Mass.

INDUSTRY TAKES THE NON-STOP ROUTE



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SIZING MATERIALS—Liquid Rosin Size in tank cars and drums, Dry Size in bags, Alwax and Waxine Sizes in drums.

CASEIN—Made with up-to-date equipment that insures the high speeds so essential in securing uniform high quality.

AMERICAN CYANAMID & CHEMICAL CORPORATION

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Scaling and Measuring Pulpwood*

By R. F. Rogers[1]

Scaling and measuring pulpwood is such an important item that this program would hardly be complete without some discussion on the matter. It is the writer's impression that here in the Lake States we are quite content with the scaling methods used by our grandfathers. The scaling units generally accepted by all concerned are the cord of 128 cubic feet for short wood and board measure for hemlock logs. Herman H. Chapman has devoted 520 pages to this subject of scaling in his book entitled "Forest Mensuration." He deals, of course, with the entire subject from bush to mill and from one end of the country to the other. This paper is confined primarily to local mill practice.

There are three methods or units which lend themselves to an accounting between the producer and buyer. One is our present method of board measure and the cord; one is the cunit which may be said to be 100 solid cubic feet of white wood; and one is a unit of weight which for the lack of a better name we will call a "wood-ton."

No doubt you are all familiar with the method of scaling and measuring in the Lake States. The contents of hemlock logs are established in board feet and the producer receives so much per 1,000 b.f. for his product. This method was borrowed from the saw mills. All other shipments of pulpwood come under the unit known as the cord, which generally is said to be 128 cubic feet or represented by a pile of wood 4 feet by 4 feet by 8 feet. The contents of a tier of short wood on a car or truck in terms of cords is determined by multiplying the length of the tier by the height of the tier and by the length of the wood and dividing by 128.

For statistical purposes, board measure is converted to cord measure by dividing it by 444. In other words, it has been found that 1,000 board feet is equivalent to 2.25 cords or 1 cord is equivalent to 444 board feet.

The measuring of wood from lakes or rivers to wood yard or wood room requires, of course, a different practice, although the general practice is to convert it into cords. This may be accomplished by determining the average sticks per cord and counting the sticks moving up the jackladder from the water, and establishing the cordage by dividing the total count by the established sticks per cord. This comparatively simple method of scaling and measuring requires about 2 men per 8 hour day at the average Lake States mill.

Cunit Measurement

Consider next the cunit method of measuring. Taking up the matter of short wood, that is, 8 feet or 4 feet, several complications arise. It can be assumed that the cunit method of determining the solid content of wood in a pile on a truck or car would require measuring the diameter of each stick on the conveyance or the selection of a representative area, say 1/20 of the total, measuring the sticks in this area and applying the results to the total area. If this latter scheme were used, the end result would be our present method of scaling since the entire space occupied by a tier of wood would have to be established in terms of cords or cubic feet. Statistically and otherwise there would be no advantage over our present method. If the cunit measure were used to the extent of measuring every stick on the car, the problem of measuring the wood in the gondola boxes would present itself. It is safe to say that by far the majority of short wood arrives at the mills in gondolas. Should the wood arrive at a mill in a manner which would permit the measuring of each stick, it would be difficult to estimate the number of scalers that would be required to do the measuring. Further, if the diameter of the sticks were measured with a rule to the nearest 0.25 inch, your scale slip would require 56 columns for the recording of the separate diameters. Also a difference of 0.25 inch in diameter determination on a 6 inch stick would represent an error of about 8 per cent. That is, a 6.25 inch diameter stick contains 8 per cent more wood than a 6 inch diameter stick. This is mentioned merely to show the possibility of error in this method.

It might be suggested that instead of taking the diameter of the stick with a rule that a tape be used and the solid cubic feet read direct. In the case of rough wood, that is wood unpeeled, an allowance would have to be made for bark either in the tape reading or in the total measurement. Since wood is piled unevenly on a car, it would be impossible to tape each stick even though the wood were loaded in open equipment. All of this would lead to error.

There is just one more thought in connection with the cunit as far as short wood is concerned. A pulpwood producer buys his stumpage on the basis of a cord and all his cost calculations are based on this unit. Just imagine if you will the chore of educating the producer to use a method that will require him to cube his wood in the way of determining the number of units he has, either standing in the forest or manufactured.

As far as hemlock logs are concerned, the cunit system would work out well from a mill standpoint. Measuring by this method would not be any more costly than the present board measure method. The solid contents of a log could be determined by measuring each end and finding the average diameter, or the small end could be measured

* Presented at the meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry, Appleton, Wis., Oct. 13, 1936.
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and an allowance made for taper. There should be no difficulty in either case in establishing the solid content and the results would be reasonably accurate. The yield from 100 cubic feet of white wood would vary only through a difference in density of the wood, whereas the yield from 1,000 b.f. would vary through a difference in density and also according to the size of the logs. Within certain limits, as the diameter of the log decreases, the solid cubic feet of wood per 1,000 b.f. increases. The chief obstacle in changing from our board feet method of scaling hemlock logs to the cunit method is the producer. The 1,000 board feet content is the standard method used in estimating saw log timber in this district and numerous producers when estimating hemlock stands on their lands and when manufacturing hemlock logs do not know at the time of estimating and manufacture whether their product is going to a saw mill or pulp mill. Hence, changing from the board foot method to the cunit method would cause some confusion among the producers. In closing the subject of the cunit, it is the personal opinion of the writer that this method will not lend itself to short wood but that it could be satisfactorily applied to hemlock logs from a mill standpoint. This is merely an opinion and not a proposal that the cunit method be adopted for logs.

The Wood-Ton

Now consider the matter of the "wood-ton" as a unit. First, all wood arriving at the mill would have to be accurately weighed and that wood coming from storage also would have to be accurately weighed in order to properly keep the wood yard inventory balanced and, of course, all cars would also have to be accurately weighed light. Having established the wet weight, the next step would be to establish the oven-dry weight. The accuracy of this method would depend on the number of moisture samples taken, how they were taken, and from what part of the stick they were taken. At a mill where all wood is received on cars, it is hard to conceive an organization investing in drying ovens and labor to the extent required in this "wood-ton" method. In the case of weighing rough wood some allowance would have to be made for bark. As far as the producer is concerned, one can readily imagine his reaction to any such proposal as the "wood-ton."

All of this leads back to the present method of scaling and measuring which at least is simple in application, not costly to perform, and fairly acceptable to all concerned.

So far the matter of scaling and measuring of pulpwood on arrival at the mill and in and out of storage has been considered. Take just a moment to cover the subject of converting the wood into units for more accurate control work in the mill. The problem here is to establish the pounds of a.d. wood entering the mill as a check against the a.d. pulp produced. This weight can be established in two ways. One method is to establish the wet weight by use of a weightometer and by taking moisture tests establish the a.d.-weight. The other method is to establish the volume by use of an electric eye and by taking density tests establish the a.d.-weight. The first method is in fairly wide use at present and is apparently quite satisfactory. The second, now being developed experimentally, presents interesting possibilities.

Kalamazoo Valley Section of TAPPI Discusses Sulphonated Oils

The May meeting of the Kalamazoo Valley Section was held May 6 at the Maple Hills Country Club. Starting the latter part of the afternoon, a number of foursomes braved a cold wind to compete for prizes offered by the American Cyanamid & Chemical Corporation. The blind bogey contest was won by Mr. Perlick, with Bill Randall the runner-up. Mr. Melenbacher won the prize for the lowest number of putts, with Messrs, Eastman, Faram and Hurst, taking secondary honors.

After the dinner, which was attended by about 70 members, a short tribute was paid to the late Bill Snyder, who was recently killed in an automobile accident.

R. A. Diehm, of the Rohm & Haas Company gave a very interesting and informative talk on the relationship between the various types of Enzymes and the different starches. His paper will be printed in full at a later date and will supplement those previously printed.

H. W. Rose, of the American Cyanamid and Chemical Corporation, was the second speaker, and he gave a very complete analysis of the sulphonated oil set-up, covering the origin, chemical motive and manufacturing. This paper also will be printed.

The next meeting, it was announced will be be held on June 3rd at Watervliet where a golf tournament, Mill visit, and dinner meeting are scheduled. W. A. Kirkpatrick, of Allied Paper Mills, will present a short paper and lead a discussion on the testing and evaluation of coated papers and raw materials. Professor Pellett of Western State Teachers College will show some motion pictures on fishing which are reported to be extremely interesting.

The following were present: W. A. Kirkpatrick and F. R. Kettle, Allied Paper Mills; L. R. Verdon, V. Heinmuller, Don Ritchie, W. S. Taylor and H. W. Rose, American Cyanamid and Chemical Corporation; W. J. Higbie, R. T. Washburn, Paul Easton, H. R. Miller, R. F. Irwin, H. O. Wace, H. F. Heller, H. M. Eastman, P. W. Bartholomew and Fred L. Chappell, Hercules Powder Company; E. F. Whittington, H. C. Bradford and Heinie Nundorf, Rex Paper Co.; Glenn T. Ingling, Kalamazoo Paper Company; H. J. Hotz and Wm. J. Dial, Central Paper Company; C. A. Braginton, G. C. Schmid, A. E. Hays, Paul de Guehery, Ray L. Barton and Wm. H. Astle, Michigan Paper Company; Ted Parker and O. Flatland, Eddy Paper Corporation; A. B. Perlick, L. H. LaLiberte, Frank Libby and W. F. Hathaway, Kalamazoo Vegetable Parchment Company; C. C. Schneider, Hawthorne Paper Company; J. H. Adams, C. W. Steele and J. R. Stephenson, American Coating Mills; C. F. Sisson and W. F. Wolfe, Mac Sim Bar Paper Company; H. F. Roderick and H. B. Browne, Michigan Alkali Company; W. R. Tobin and Charles B. Morris, American Box Board Company; Donald J. Brady and Karl Melenbacher, Container Corporation; Ralph Atkins, Arthur Weinland and Harold F. Dewey, Lee Paper Company; R. A. Diehm, Rohm & Haas Company, Inc.; Baldy Smith, Huron Milling Company; Buster Griffiths, Heller & Merz; S. H. Lindner, W. H. Randall, R. H. Olson and M. R. Wilkins, Bryant Paper Company; R. H. Hurst, Hugh Smith and John E. Bauman, Kalamazoo Vegetable Parchment Company; Walter E. Eisele, Francis Hamilton and Y. T. Kao, Student, University of Michigan; Ethan E. Hunting, and Prof. D. W. McCready, University of Michigan; R. J. Eldridge, Western States Teacher College.

Instrumentation Studies. XIII

Adaptability of the G. E. Reflection Meter as a Color Analyzer

By The Staff of The Institute of Paper Chemistry

PART III

The Effect of Infra-Red Fluorescent Radiation Upon "Brightness" Measurements Obtained with the G. E. Reflection Meter*

Research work described in Parts I and II, on the "Adaptability of the G. E. Reflection Meter as a Color Analyzer", demonstrated that the G. E. Reflection Meter may be used for the purpose of obtaining spectral reflectance curves of colored samples, if a special optical filter is placed between the test sample and the photoelectric cell. The auxiliary filter must satisfy two requirements: *(a)* it must pass visible light freely, and *(b)* it must stop infra-red light.

In the original design of the G. E. Reflection Meter, provision was made for an optical filter to be placed between the source of light and the test sample which would remove all infra-red light from the light which illuminates the test sample. This was done with the knowledge of the following facts: *(a)* a tungsten filament lamp emits infra-red light; *(b)* the photoelectric cell responds to infra-red light; *(c)* the several monochromatizing filters, while opaque to all wave lengths of the visible spectrum excepting the small range of wave lengths in which they pass light freely, are fairly transparent to infra-red light; and *(d)* the test sample should not be subjected to the heating caused by the infra-red light. A glass cell containing a solution of copper sulphate was chosen for removal of the infra-red light from the incident beam. In face of the fact that no infra-red light fell upon the test sample, it was mystifying to find that a second infra-red-stopping filter† had to be placed between the test sample and the photoelectric cell to obtain reasonably accurate reflectance values of certain colored samples. The hypothesis was advanced that part of the energy of the visible light falling upon the test sample is transformed into infra-red light, i.e., the infra-red light would be a fluorescent radiation excited by visible light. This theory was advanced with caution, because an infra-red fluorescence of this sort was, so far as could be determined, unknown to the science of radiation. The reality of this new type of fluorescence was definitely established by many special experiments with the reflection meter, and by experiments performed with a special research set-up.

The new fluorescence effect was established early in 1935. The experiments performed with the reflection meter (see Part II) were of two kinds: First, reflectance values were obtained on a reflection meter with, and without, the auxiliary filter between the test sample and the photoelectric cell. If the pair of reflectance values were in close agreement, it was concluded that the effect of the infra-red fluorescence of the test sample was negligible. Second, filters such as 5 and 8 (Wratten filters 74 and 71a) in combination, were placed before the photoelectric cell, and the amplified photocurrents arising when the various samples were placed over the sample opening were noted. A combination of filters like 5 and 8 is opaque to light in the visible spectrum but fairly transparent to infra-red light, particularly to that portion of the infra-red of wave lengths slightly in excess of about 800 millimicrons. Hence, the amplified photocurrents could be taken as a measure of the intensity of the fluorescent radiation. The two methods were in agreement where the fluorescent effect was large enough to be important.

Experiments were performed to find the effect, if any, of the fluorescence upon the measurement of brightness (reflectance with filter 1) of white and near-white papers. The fluorescent radiations from white Carrara glass standards and white bond papers were found to be small and of about the same magnitude. When the brightness of a white bond paper was measured against a glass standard (white Carrara) with an auxiliary filter between the sample opening and photoelectric cell, the reflectance values were found to be slightly *higher* than the values obtained in the absence of the auxiliary filter. The differences, which were not large, were attributed to a slight shift in effective wave length caused by the nature of the spectral transmission of the auxiliary filter. The data of these experiments led, then, to the conclusion that the fluorescence effect was sufficiently small in white papers and glass standards to cause only negligible errors in brightness values.

However, after submission of Parts I and II to the Central Grading Committee of the American Paper and Pulp Association, evidence tending to negate this conclusion accumulated. Therefore, in view of the importance of maintaining a brightness scale of good fundamental accuracy, a great deal of careful work has been done on the problem of determining whether or not all brightness measurements should be made with an auxiliary infra-red-stopping filter between the sample and the photoelectric cell. It is now concluded, after careful deliberation on accumulated data and the theory of measurement where the fluorescent radiation is not eliminated, that the effect upon brightness values of the fluorescent effect is important and that carefully standardized infra-red-stopping filters must be installed in all reflection meters.

Theory and Data on the Error in Brightness Due to Infra-Red Fluorescence

In the following presentation, we deal with the quantities:

R_0 — True reflectance of a standard,
R'_0 — Apparent reflectance of the standard,
R_1 — True reflectance of a sample,
R'_1 — Apparent reflectance of the sample,
s — Change in plate current per unit (1 per cent) change in reflectance, or sensitivity,
i_1 — Change in plate current due to fluorescent infra-red radiation from the sample, and
i_0 — Change in plate current due to fluorescent infra-red radiation from the standard.

In the above definitions, "apparent" refers to values obtained when the fluorescent radiation is not eliminated; "plate current" is the electrical current in the plate circuit of the amplifier tube; changes in plate current are given by the microammeter on the panel of the reflection meter.

As carried out in the past, a brightness reading is obtained by *(1)* turning the filter wheel to "1", *(2)* placing the sample over the sample opening and setting the reflectance dial to the *apparent* reflectance of the standard, *(3)* adjusting the light to the "dummy" photocell to obtain a plate current of, say, 250 microamperes, *(4)* removing the sample and placing the standard over the sample opening and turning the reflectance dial to obtain the *same* plate current as was obtained under operation *(3)*. The appar-

* This report was submitted to the American Paper and Pulp Association on January 2, 1937; Parts I and II were submitted November 20, 1935.

† In the remainder of this report, this filter is referred to as an "auxiliary filter." A new auxiliary filter designed specifically for use in the reflection meter is described in a later section.

ent reflectance of the sample is then read from the reflectance dial.

When the sample or standard is in place, the plate current is determined by *(a)* the light reflected by the sample (or standard) and passed by the number 1 filter, and *(b)* the fluorescent radiation originating in the sample (or standard) and passed by the number 1 filter. When fluorescent radiation is not eliminated, the operational equation for the reflection meter may be written:

$$s R_1 R'_0 + R'_0 i_1 = s R_0 R'_1 + R'_1 i_0$$

A constant of proportionality between angular opening and reflectance units and another constant which involves the geometry of the reflection meter have been canceled from the above equation. Making a few approximations which are justified by the fact that, in developing an equation for an error, one is not interested in high precision in expression of the error, it is easily shown that the difference between the apparent and true reflectances of a sample (or sub-standard) is given by the equation,

$$R'_1 - R_1 = (R_1/R_0)\ (R'_0 - R_0) + (1/s)\ [i_1 - (R_1/R_0) i_0] \quad (1)$$

In words, this equation states that the error in reflectance caused by fluorescence depends upon the error in the standard and upon a term involving the intensities of the fluorescent radiations from the sample and standard, the sensitivity of the photoelectric cell to visible light (wave length of about 450 millimicrons), and the sensitivity of the photoelectric cell to infra-red light. The error in the standard is due mainly to the fluorescence effect; it includes, incidentally, any reflectance change due to aging or other natural causes.

Equation (1) above was developed to give quantitative expression to the demonstration of the kind of errors that are involved when brightness determinations are made without the use of the auxiliary filter. To illustrate this equation, it is necessary that all data involved be obtained on the same instrument, and that all instrumental adjustments, such as state of focus of the lamp filament image in the sample opening, remain fixed. Hence a new reflection meter was put into operation, and, after the initial adjustments had been made, no further adjustments of any sort were made. First, with the number 1 filter (Wratten 49) in place, the sensitivity s was determined. This was done by placing a block of magnesium carbonate over the sample opening, setting the reflectance dial at "100", adjusting the light to the "dummy" photoelectric cell to obtain a plate current of 250 microamperes, and noting the numerical relation between a small change in plate current and the small change in setting of the reflectance dial which produced the change in plate current. In this way s was found to be 17 microamperes per 1 per cent change in reflectance.

Next, it was necessary to determine the change in plate current caused by that part of the infra-red fluorescent light which is gathered by the receiving optical system and is passed by the number 1 filter. This was done by setting the reflectance dial to "100", placing a Wratten 88 (infra-red transmitting) filter over the number 1 filter, and, with the room dark and nothing over the sample opening, the light to the "dummy" photoelectric cell was adjusted to obtain a plate current of about 250 microamperes. Then, upon placing a substance over the sample opening, the increase in plate current was due to the fluorescent infra-red light generated in that substance by the visible light falling upon it. In this way, the i values given in Table I were obtained.

To obtain the i_1 and i_0 values required in equation (1) from the data of Table I, it is necessary to know the transmission of the Wratten 88 filter to the fluorescent infra-red radiations. Since the spectra of such radiations are

TABLE I.—PLATE CURRENT INCREMENTS DUE TO FLUORESCENT INFRA-RED LIGHT FROM SEVERAL SUBSTANCES, WRATTEN 88 FILTER USED TO STOP VISIBLE LIGHT PASSED BY NUMBER 1 FILTER

Substance	Plate Current Increment, microamperes
Magnesium carbonate	12
Enamel standard (Number 10)	10
Enamel standard (Number 18)	12
White Carrara glass standard (M-220)	54
White bond paper	19
Ticket paper (near-white)	57
Dark green cellophane *	218

* This is the sample referred to in Part II, Table V; the sample was not backed by a diffuse reflector.

not yet known, these transmissions cannot be determined with satisfactory accuracy. Possible values can, however, be estimated in the following way. Transparent substances have negligible reflectances; hence, for such substances, the plate current increments due to fluorescent infra-red light can be determined when only the number 1 filter is in place; then the Wratten 88 filter is added, and the plate current increment is noted. The quotient of the increments gives the transmission of the Wratten 88 filter to the infra-red light passed by the number 1 filter. Data of this sort were obtained for several Wratten filters (chosen at random) and the dark green cellophane sample of Table I; these data, and the corresponding transmissions for the Wratten 88 filter, are given in Table II.

TABLE II.—PLATE CURRENT INCREMENTS DUE TO FLUORESCENT INFRA-RED LIGHT FROM TRANSPARENT SUBSTANCES, WITH AND WITHOUT THE WRATTEN 88 FILTER, AND CORRESPONDING TRANSMISSIONS OF THE WRATTEN 88 FILTER

Substance	Plate Current Increment Filter 1 Alone, microamperes	Plate Current Increment Filter 1 and Wratten 88, microamperes	Transmission of Wratten 88
Dark green cellophane	320	218	0.68
Wratten 75	23	17	0.74
Wratten 76	38	30	0.79
Wratten 77	70	57	0.81
Wratten 77 †	112	105	0.94
Wratten 74	15	13	0.87
Wratten 73	25	19	0.76
Wratten 72	23	14	0.61
Wratten 71a	42	37	0.88
Wratten 70	67	55	0.82
Wratten 62	75	65	0.87
Wratten 60	42	32	0.76
Wratten 56	109	92	0.84
Wratten D35	40	27	0.68
Wratten 32	62	47	0.76

† Numbered side down; Wratten 77 is a "doublet."

Inspection of Table II shows that the transmissions range from 0.61 to 0.94; in consideration of reflection losses (at the faces of the filter) the transmission of 0.94 is probably the highest possible value. It is known (Eastman Kodak Company, bulletin on "Wratten Filters") that the transmission of Wratten 88 is zero for wave lengths less than about 690 millimicrons, and rises rather rapidly in the neighborhood of 730 millimicrons (at which wave length it is 0.47), going to a maximum value of about 0.9 for wave lengths somewhat in excess of about 760 millimicrons. Incidentally, then, since most of the transmissions are in the neighborhood of about 0.8, the present data lead to the conclusion already reached from past work that the fluorescent radiation with which we are dealing is in the near infra-red.

The possible i_1 and i_0 values to be inserted in equation (1) may be obtained by dividing the plate current increments given in Table I by transmissions in the range 0.6 to 0.94. If, using these possible i_1 and i_0 values, we can compute errors that agree with the observed errors, we may then conclude that the theory of the error due to fluorescence is adequate.

"Apparent" and "true" reflectance values were obtained on the reflection meter with the number 1 filter alone, and the number 1 filter in combination with an auxiliary filter (Jena, BG-18), respectively. These reflectance values are given in Table III.

The calculated differences will now be compared with

TABLE III.—"APPARENT" AND "TRUE" REFLECTANCE VALUES FOR WAVE LENGTH 450 MILLIMICRONS (BRIGHTNESS VALUES)

Sample	Standard and Assumed Reflectance	Apparent Reflectance (R'_1); Jena Auxiliary Filter *out*, per cent	True Reflectance (R_1); Jena Auxiliary Filter *in*, per cent
Glass standard (M-220)	Magnesium Carbonate 100	73.2	70.7
Enamel standard (Number 10).	Magnesium Carbonate 100	75.9	75.8
Enamel standard (Number 18).	Magnesium Carbonate 100	59.1	59.0
White bond paper	Magnesium Carbonate 100	73.5	72.7
White bond paper	Glass standard (M-220) *73.2*	73.7	75.6* (72.9)
Ticket	Magnesium Carbonate 100	62.7	59.8
Ticket	Glass standard (M-220) *73.2*	62.8	62.1† (59.8)

*The apparent value of the standard was used, for this corresponds to old practice; if 70.7 had been used, the value would have been 75.6 (70.7/73.2) or 72.9, in good agreement with the true value 72.7 obtained against magnesium carbonate.

†Again, the apparent value of 73.2 was used; if 70.7 had been used, the value would have been 62.1 (70.7/73.2) or 59.8, in agreement with the true value 59.8 obtained against magnesium carbonate.

the differences shown in Table III.

Glass Standard (M-220). The glass standard is now to be regarded as "sample". When magnesium carbonate is standard, the quantity $(R_o - R_o)$ in equation (1) must be put equal to zero [if, however, one block of magnesium carbonate was used for the "apparent" reflectances and another block for the "true" reflectances, $(R'_o - R_o)$ would not be equal to zero, since small differences in *absolute* reflectance exist between different blocks]. By trial, it has been found that, if the transmission of the Wratten 88 to the fluorescent radiation (hereafter referred to simply as T) from the glass standard is 0.94, and T for magnesium carbonate is 0.7, then

$$R'_1 - R_1 = 0 + 0.06(57-12) = +\ 2.7 \text{ per cent}$$

which agrees well with the observed difference (Table III) of + *2.5 per cent.* In this case, the difference in brightnesses obtained with and without the auxiliary filter is certainly not negligible.

Enamel Standard (Number 10). T for magnesium carbonate is again taken equal to 0.7; the same value is taken for the enamel. Then,

$$R'_1 - R_1 = 0 + (0.06/0.7)[10-(76/100)12] = +\ 0.1 \text{ per cent},$$

which agrees with the observed difference of + *0.1 per cent.*

Enamel Standard (Number 18). Again, T is taken equal to 0.7. Then,

$$R'_1 - R_1 = 0 + (0.06/0.7)[12-(76/100)12] = +\ 0.2 \text{ per cent},$$

which is in satisfactory agreement with the observed value of + *0.1 per cent.* It will be noticed that the reflectance values of both enamels are virtually unchanged by the addition of the auxiliary filter. This has been observed frequently and is explained by the theory presented here.

White Bond Paper: Magnesium Carbonate Standard. T is taken equal to 0.7 for the paper, as well as for magnesium carbonate. Then,

$$R'_1 - R_1 = 0 + (0.06/0.7)[19-(73/100)12] = +\ 0.8 \text{ per cent},$$

which agrees with the observed difference of + *0.8 per cent.*

White Bond Paper: Glass Standard. Again, T for this paper is taken equal to 0.7, and that for the glass standard, as before, is taken equal to 0.94. Then,

$$R'_1 - R_1 = (73/71)\ (73.2-70.7) + 0.06\ (19/0.7) - (73/71)\ (54/0.94) = +\ 2.6-1.9 = +\ 0.7 \text{ per cent},$$

which agrees with the observed difference, 73.7 — 75.6(70.7/73.2) or + *0.8 per cent.* As mentioned in the footnotes of Table III, the value of 73.2 per cent was assumed for the glass standard, since this corresponds to past practice. It will be noticed (Table III) that when the paper is measured against a glass standard and the apparent reflectance of this standard is used the apparent reflectance of the paper *increases* when the auxiliary filter is added. A similar rise is indicated in Part II, Table IV b; the values given there for filter 1 were obtained using a glass standard. Hence the rise shown in Table IV b of Part II is adequately accounted for by the present theory. At the time Part II was written, the rather complex connection between true and apparent reflectances and the fluorescence radiation was not fully appreciated, and the rise mentioned above was erroneously attributed to the change in spectral character of the visible light caused by the addition of the (greenish) auxiliary filter. Part of the rise, indeed, is due to a shift of effective wave length to a greater value, but all indications are that the rise due to this shift is small compared with the rise due to the use of the erroneous value for the glass standard and the discrepancy caused by fluorescence when paper is measured against a glass standard in the absence of the auxiliary filter. It should be emphasized at this point that the rise observed when the auxiliary filter is added is observed only when the reflectance of the test sample is measured against the *glass standard* and the apparent or erroneous value of the glass standard is used; when the paper is measured against magnesium carbonate, the reflectance of the paper *falls* upon the addition of the auxiliary filter.

Ticket Paper: Magnesium Carbonate Standard. As before, the T value associated with magnesium carbonate is taken equal to 0.7, while the T value for the ticket paper is taken equal to 0.94. Then,

$$R'_1 - R_1 = 0 + 0.06((57/0.94 - (60/100)\ (12/0.7)) = +\ 3.0 \text{ per cent},$$

which agrees with the observed difference of + *2.9 per cent*; the assumed T value for the paper, 0.94, is, however, the maximum permissible value, and, if 0.9 were used instead, the computed difference would have been + *3.2 per cent.* Now the slope of the spectral reflectance curve for this paper in the region 400 to 500 millimicrons is about as great as is ever observed for near-white papers; hence, *in this case*, the change in spectral character of the light caused by the auxiliary filter should be noticeable. The above figures show, that, while differences between computed and measured differences in reflectance are small, they are in the right direction to be explained by a small shift in effective wave length to a larger value. It should be emphasized that the observed and computed error of about 3 per cent in the apparent brightness of the ticket paper is very appreciable.

Ticket Paper: Glass Standard. As before, the T value associated with the glass standard is taken equal to 0.94, while that for the ticket paper is taken equal to 0.9. Then,

$$R'_1 - R_1 = (60/71)\ (73.2-70.7) + 0.06((57/09) - (60/71)(54/0.94)) = +\ 2.1 + 0.9 = +\ 3.0 \text{ per cent},$$

which agrees with the observed difference of 62.8—62.1—(70.7/73.2) or + *3.0 per cent.*

General Discussion

The foregoing treatment shows that, using plausible values of T (therefore plausible values of the plate current increments i_1 and i_0 due to the infra-red fluorescent radiations from the sample and standard), the differences between brightness readings obtained with and without the auxiliary filter are completely accounted for by the theory. It should be noted that consistently the same T values were used for magnesium carbonate ($T = 0.7$) and for the glass standard ($T = 0.94$) throughout the several calculations.

Attention is called to the large fluorescence effects indicated in Tables I and II and the serious discrepancies be-

tween apparent and true reflectance values shown in Table III. If another photoelectric cell suitable for use in the reflection meter were used, quantities of the sort given in Tables I, II, and III might be widely different from those given in this report. A photoelectric cell has been considered suitable for use in the reflection meter if its spectral response curve in the region from 400 to 500 millimicrons fell within certain prescribed limits; there is no reason to believe, however, that all suitable cells have similar sensitivities to the fluorescent radiation, and indeed, it is now known that the infra-red sensitivities of these cells differ very greatly. (One photoelectric cell has been found which exhibits a relatively low infra-red sensitivity; when this cell is placed in a reflection meter, and reflectance values of papers versus magnesium carbonate are obtained, it is found that the values are only slightly changed by the addition of the auxiliary filter.) In the past it has been found impossible to use certain "suitable" photoelectric cells in the reflection meter; when the variable nature of the fluorescence error is considered, it is appreciated that the task of calibrating reflection meters and maintaining them in calibration has been a laborious one. Many peculiar irregularities observed in the use of the reflection meters are now explained in the light of the theory of the new fluorescence effect.

It may be remarked that, in view of the foregoing, it would have been impossible previously to calibrate reflection meters to read correctly all papers against both magnesium carbonate and glass standards. In the past, calibration has been done with glass standards and checking papers whose brightness values covered a relatively narrow range. Considerable difficulty, indeed, was experienced when it was necessary to adjust an instrument so that it would check in the usual calibration range, and, at the same time, read glass standards and papers against magnesium carbonate to within a few tenths of one per cent. The irradiation of light within the glass standards (see Part II) was responsible for the circumstance that, by changing the state of focus and position of the image of the lamp filament, it was possible to vary the apparent reflectance of glass standards (as read against magnesium carbonate); it is now understood that the irradiation effect made it possible to calibrate instruments within close limits, in spite of the hidden error due to infra-red fluorescence. Evidence has accumulated, however, which shows that two reflection meters might not agree to within as much as 2 per cent or more on papers whose brightness values are *outside* the normal calibration range, and occasionally one hears of brightness values for high brightness fillers which are appreciably in excess of 100 per cent (since the absolute reflectance of magnesium carbonate is about 98 per cent, the maximum possible brightness of any substance, referred to magnesium carbonate as 100 per cent, would be about 102 per cent). These difficulties are explicable on the basis of the fluorescence theory presented in this report.

At the present writing, seven reflection meters have been equipped with the auxiliary filter at The Institute of Paper Chemistry. The auxiliary filter is of a special type, described later in this report. One of the seven reflection meters referred to is the new master instrument. No difficulty was experienced in calibrating all seven instruments to read a wide range of papers, glass standards, and enamel standards against magnesium carbonate, and against the glass and enamel sub-standards within very close limits. In the past, on the old system, it would have been nearly impossible to accomplish this; it would have been necessary (as we now understand it) to obtain several "active" photoelectric cells which were not only similar in spectral response in the region 400 to 500 millimicrons, *but also similar in spectral response in the near infra-red region.* As stated before, past calibration of reflection meters in use has been done with glass standards and papers whose brightnesses covered a rather small range (approximately 20 per cent), and accurate calibration was apparently possible because of the property of glass standards to irradiate light from unilluminated portions of their surfaces.

As one would expect, brightness values obtained with reflection meters equipped with the new auxiliary filter are in much better accord with spectrophotometric data obtained on the Hardy color analyzer than are values obtained on the old scale. Present differences between brightness and reflectance at 450 millimicrons obtained from the Hardy color analyzer spectral reflectance curves are generally small and are attributable mainly to the choice of 450 millimicrons for the effective wave length associated with the number 1 filter of the reflection meter. Strictly, the effective wave length depends to a small extent upon the spectral reflectance curve of the test sample. If the effective wave length for a perfectly neutral sample is 450 millimicrons, that for a "yellowish" sample might be fairly close to 460 millimicrons. Now, if these shifts in effective wave length are taken into account, virtually all of the differences between new brightness values and spectrophotometric reflectances are accounted for. This could not be done for brightnesses determined on the old scale. Occasional differences noted in the past have been as large as two or three per cent, and these differences (for white and near-white papers) are typical of the differences now noted between old and new scale brightness values.

After consideration of the fluorescence error it is realized that a definite answer can not be given to the question, "How much lower are brightnesses obtained with the use of the auxiliary filter than brightnesses obtained in the past without the use of this filter?" The brightnesses of enamels and other substances which fluoresce infra-red light of relatively low intensity are not materially changed by the addition of the auxiliary filter. The change in brightness of papers depends entirely upon the degree of the fluorescence effect in the papers; the degree of the fluorescence effect in papers of the same kind made in different mills varies through wide limits, and it is possible that this statement may be true for papers of the same kind made in the same mill. The order of magnitude of the changes for white and near-white papers appears to be in the approximate range, one to three per cent. Where the brightnesses of papers are measured against magnesium carbonate, the changes observed on one reflection meter would not be comparable with those observed on another, because, as has already been stated, the sensitivities of the photoelectric cells to infra-red light vary over wide limits.

Temperature Effect

The current of 54 microamperes given in Table I for the amplified photoelectric current due to infra-red fluorescent light from a glass standard is quite typical. It was suggested that possibly these rather large currents were dependent upon the temperature of the glass. To test this possibility, a reflection meter was equipped with the infra-red transmitting combination of Wratten 49 and 88 filters, and, working in a dark room, the amplified photoelectric current due to the fluorescent infra-red light was obtained for various temperatures of a glass standard. It was found that the amplified photoelectric current *changed by a factor of two in the temperature range, 0 to 75 deg. C.* When the currents were plotted versus temperature of the bath in which the glass standard was heated, a smooth curve falling with rising temperatures was obtained. This curve starts at 51 microamperes at a temperature of 0 deg., and drops to a little less than 25 microamperes at a tem-

perature of 75 deg. C. The effect was found to be reversible; that is, when the glass standard was allowed to cool off, the amplified photoelectric current increased through the prior values.

While this temperature effect is of considerable scientific importance, we are here concerned with its importance to the measurement of brightness. In typical use, the temperature of the glass standards might vary over fairly wide limits during the course of the year. Where instruments have been operated in constant temperature rooms, the temperature of the glass standards could be anything from that of the room to the temperature attained when the standard is left on the top panel of the instrument. In other places, the temperature variation might have been from about 20 deg to over 50 deg. C. (the latter temperature being attained when the standard rests on the top panel of the instrument on a very hot summer day). The fluorescence error, then, has been a function of temperature. To test this, the brightness of a white bond paper was measured against a glass standard whose temperature was made to vary from 20 deg. to 75 deg. C. In this test, the auxiliary filter was not present, in order that the results might be typical of past variations in brightness due to temperature differences. Plotting apparent brightness against approximate temperature of the glass standard yielded a smooth curve which exhibits a surprising rise with increasing temperature. This curve starts at 79.4 per cent at a temperature of 20 deg. C., passes through 80.6 per cent at a temperature of 50 deg. C. and goes to 81.5 per cent at a temperature of 75 deg. C. Taking 30 deg. C. as the extreme range of temperatures, the extreme variation in brightness due to the temperature effect would be about 1.2 per cent. In practice, it is highly doubtful that an error of this magnitude caused by temperature differences alone has entered, since the pertinent temperature differences are those which occur in a mill laboratory over the period of time between receipt of fresh standards (one month), and which occur between the laboratory at The Institute of Paper Chemistry and the mill laboratories. Taking 0 to 10 deg. C. as the range of typical temperature differences, the error in brightness due to the variation of the fluorescence effect would have varied from 0 to about 0.4 per cent, an appreciable but not important error. This error is completely eliminated by the addition of the auxiliary filter described in the next paragraph. When brightness measurements were made with this auxiliary filter in place, no changes of reflectance of the glass standard were observed when the temperature of the glass was varied through wide limits.

Special Filter for Elimination of the Fluorescence Error in the G. E. Reflection Meter

The glass of the Jena BG-18 optical filter, of melt No. S-1152, was found to be the most suitable for our purposes. A number of filters from this melt were cut into small squares and ground to a uniform thickness of 0.020". Calculations involving the spectral absorption coefficients of this glass showed that filters of this thickness would pass visible light as freely as is consistent with the most practical requirement that the fluorescent infra-red light be blocked.

The use of a thin Jena BG-18 S-1152 filter has two advantages. First, because the filter is thin, the transmission is sufficiently appreciable near the red end of the spectrum to allow of greater precision where filter number 8 is used than was possible in the past with a BG-18 filter 2 mm. thick. Second, the slope of the spectral transmission curve of a BG-18 filter of the particular melt chosen (S-1152) is much smaller in the region 400 to 500 millimicrons than that of the 2 mm. BG-18 filters which have been used in the past; because of the smaller value of this slope, the shift of effective wave length caused by the addition of the special filter is not significant, even where the brightnesses of papers having a yellow tint are measured.

The side of the filter which has been ground has not been polished, in order that light passing through the filter will be somewhat diffused. This diffusion minimizes a small error due to lack of uniformity of sensitivity over the area of the sensitive surface of the photoelectric cell.

The new filters have been made sufficiently small to be placed in the recessed aperture located immediately above the photoelectric cell. The filter wheel of the reflection meter is removed, and the small filter is placed in the recessed aperture with the ground or "frosted" side down. Since the number 1 filter (Wratten 49) exhibits the infra-red fluorescence, the addition of the new filter at a place between the filter wheel and the photoelectric cell eliminates the small error due to its fluorescence. This error is not as large as would be expected from inspection of the fluorescence data given in Table II, because the intensity of the light falling upon a filter in its normal position is so much less than that incident upon a filter placed over the sample opening. The error does account, however, for part of the difference between the old and new brightness scales; approximately 0.2 per cent is accounted for in this way. When the data for Table III were obtained, the Jena filter (a filter of 2 mm. thickness for convenience in handling) was placed both above and below the Wratten 49 (number 1 filter). The brightness values given in Table III were obtained with the Jena filter in the correct position, namely, below the Wratten 49. Brightness values obtained with the Jena filter in both positions are given in Table IV. It will be seen that the error eliminated by placing the new filter below the filter wheel is of the order of 0.2 per cent.

TABLE IV.—BRIGHTNESS VALUES OBTAINED WITH THE NEW AUXILIARY FILTER ABOVE AND BELOW THE BRIGHTNESS FILTER (WRATTEN 49)

Sample	Brightness Jena above, per cent	Brightness Jena below, per cent	Difference, per cent
Glass standard (M-220)	70.9	70.7	0.2
Enamel standard (Number 10)	76.0	75.8	0.2
Enamel standard (Number 18)	59.0	59.0	0.0
White bond: Paper vs. $MgCO_3$	72.9	72.7	0.2
White bond: Paper vs. glass (73.2)	75.5	75.6 (72.9)	—0.1
Ticket vs. $MgCO_3$	60.0	59.8	0.2
Ticket vs. glass (73.2)	62.1	62.1 (59.8)	0.0

It is highly doubtful that the change of —0.1 per cent, in the case of white bond paper measured against a glass standard, is real, since the possible variation in the values given is approximately 0.1 per cent.

Summary

The error in brightness determinations caused by fluorescent infra-red light has been carefully analyzed, and it has been shown that this error is of a variable nature and is sometimes seriously large. The simplest means of completely eliminating this error is the addition to the reflection meter of a special infra-red-stopping filter. The outstanding results arising from the addition of this filter are: *(1)* greater fundamental accuracy in the measurement of reflectance; *(2)* greater ease in maintaining all reflection meters in accurate calibration, and in adjusting and calibrating new reflection meters; *(3)* minimization of a number of types of difficulties which have been encountered in the past by the users of reflection meters; and *(4)* reflectance measurements at the several wave lengths associated with the several filters upon both colored and white samples may be made at once without the bothersome operation, necessary in the past, of placing an auxiliary filter over the dust shield of the receiving optical system.

The Utilization of Kraft Lime Mud for the Preparation of Bisulphite Cooking Liquor*

By Otto Kress[1] and Eugene H. Williams[2]

Abstract

Sulphur dioxide was absorbed by kraft lime mud at a suitable commercial rate to produce bisulphite cooking liquor of a normal strength.

Sawdust could be used to filter the prepared cooking liquor.

Pulp produced from kraft lime mud liquor was comparable to pulp produced from normal liquor in strength, bleachability, chemical contents, and dyestuff absorption.

The small fraction of the lime mud which was insoluble in bisulphite liquor was composed chiefly of wood, carbon, and sand.

Most of the iron in the lime mud went into solution in bisulphite liquor, but the sulphur, which was formed in the reaction, was precipitated and was filtered off.

A saving on raw material of approximately $0.70 per ton of sulphite pulp might be attained by using kraft lime mud for the preparation of bisulphite cooking liquor.

Introduction

Since lime sludge from the causticizing operation of the soda process has been successfully used as a base for the preparation of calcium bisulphite cooking liquor in the sulphite process, the idea that kraft lime mud is suitable for the manufacture of calcium bisulphite liquor also seems plausible.

Approximately 900 pounds of calcium carbonate per ton of kraft pulp are produced as lime sludge in the operation of causticizing green liquor. Ordinarily, 300 to 400 pounds of limestone are required to prepare the calcium bisulphite liquor required per ton of sulphite pulp. Substitution of the kraft lime mud for fresh limestone would thus mean a saving on raw material of approximately $0.70 to $0.80 per ton of pulp. The cost of new equipment for carrying out the process will be minor. The sawdust used as a filtering medium is found in large quantities in any pulp mill. This sawdust, after it has been used as a filtering bed, can be burned in the customary manner in a recovery unit.

In carrying out the following study of the possible utilization of kraft lime mud for the production of calcium bisulphite cooking liquor, similar cooks were made using bisulphite liquor prepared from the lime mud and from a high grade commercial quicklime. The pulps from these cooks were compared with respect to yield and bleachability. Physical and chemical tests on bleached and unbleached pulps were made for comparative purposes. Sawdust was found to be a suitable medium for filtering the liquor prepared from the kraft lime mud.

The cooks and beater runs were made using laboratory equipment. The results, however, should indicate the feasibility of using kraft lime mud for the preparation of bisulphite cooking liquor on a commercial scale.

Experimental Work

I. Preparation of Bisulphite Cooking Liquor from Kraft Lime Mud.

Preliminary experiments were made to determine the rate of solution of kraft lime mud in comparison with a normal lime, when suspensions of equivalent weights were sulphited. It was found that kraft lime mud is easily soluble to produce a strong cooking liquor and, except for a relatively small amount of insoluble materials, the finished acid, according to normal testing, is the equivalent of an acid cooking liquor prepared from a normal lime.

One thousand grams of the wet lime mud, representing an ordinary mill-washed kraft lime mud of 62.8 per cent dry weight, taken from the Oliver filter, and contaminated with wood chips, oxides of iron and aluminum, silica, carbon, sodium salts, and other foreign materials, were added to 16 liters of water in a large carboy. Sulphur dioxide gas from a cylinder was added until the undissolved portion of the sludge had turned a black color (due to the presence of carbon and other foreign materials remaining after solution of the calcium carbonate). It was then filtered through filter paper on a large funnel or through a sawdust filter. By using a sawdust filter (sawdust in an acid bottle from which the bottom had been cut out), the 16 liters could be filtered through a bed of about six inches

TABLE I.—COMPARATIVE DATA ON SULPHITE SPRUCE WOOD COOKS USING COOKING ACID IN WHICH THE BASE IS KRAFT LIME MUD IN COMPARISON WITH A NORMAL LIME AS THE BASE

	Regular Cook No. 1	Lime Mud Cook No. 1	Regular Cook No. 2	Lime Mud Cook No. 2
Weight oven-dry spruce chips, g...	4522	4522	4522	4522
Moisture in chips, per cent.....	24.6	24.6	13.1	12.6
Liters of acid.....	27.1	27.1	27.1	27.1
Total SO_2, per cent.....	5.62	5.66	5.57	5.55
Free SO_2, per cent.....	4.52	4.52	4.50	4.45
Combined SO_2, per cent.....	1.10	1.14	1.07	1.10
Length of cook, hours.....	10	10	10	10
Maximum digester temperature, deg. C.....	145	145	145	145
Maximum digester pressure, pounds per square inch.....	75	75	75	75
Time to maximum temperature, hours	7.5	7.5	7.5	7.5
Total pulp yield, per cent.....	47.7	46.6	45.8	45.3
Screenings, per cent.....	0.6	0.6	0.7	0.8
* Bleach consumption of pulps, per cent	14.1	12.2	10.5	11.6
Brightness, per cent				
Unbleached pulp	52.0	53.4	53.1	52.6
Bleached pulp	78.6	79.4	....	....
Beating time to freeness of 300 cc., min.				
Unbleached pulp	65	65	95	80
Bleached pulp	65	65	....	....
Maximum mullen, points per pound				
Unbleached pulp	152	150	162	153
Bleached pulp	139	149	....	....
Maximum tear per 16 sheets				
Unbleached pulp	149	160	153	167
Bleached pulp	145	137	....	....
Maximum tensile				
Unbleached pulp	37.6	35.7	43.4	45.1
Bleached pulp	39.6	39.1	....	....
Alpha-cellulose, per cent				
Unbleached pulp	87.6	87.9	....	....
Bleached pulp	84.7	85.8	....	....
One per cent NaOH solubility, per cent				
Unbleached pulp	12.06	13.37	....	....
Bleached pulp	8.31	13.85	....	....
Lignin, per cent				
Unbleached pulp	1.77	1.48	....	....
Bleached pulp	1.14	1.16	....	....

* Bleach consumption required to give a brightness of 75 per cent.

* Submitted by the junior author as a thesis in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science. Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y. February 22-25, 1937.

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in about one hour, under a head of approximately four inches. Several filtering mediums were tried, but sawdust was, by far, the most efficient.

The clear liquor was tested for total, free, and combined sulphur dioxide. It was then adjusted, by dilution and addition of more sulphur dioxide, to give the desired strength.

II. Production of Pulp from Lime Mud Liquor and from Normal Cooking Liquor.

Similar cooks were made using the prepared lime mud liquor and liquor made from a high grade commercial slaked lime. Chips equivalent to 4522 grams of oven-dry wood were charged into a stainless steel digester, and 27.1 liters of liquor were added. The cooking was carried out on a 10 hour schedule, the maximum temperature of 145 deg. C. being reached in 7.5 hours; the maximum digester pressure was 75 pounds per square inch gauge. Table I gives the essential data on these cooks.

III. Comparisons of the Prepared Pulps.

The yields, bleach consumptions, and physical and chemical characteristics of the pulps are also shown in Table I.

Dyeings of two and eight pounds strength of typical basic, acid, and direct colors (Safranine T Extra, Brilliant Crocein FL, and Pontamine Sky Blue 6BX) were made on the bleached and the unbleached pulps prepared by using acid made from kraft lime mud and from normal lime. These dyeings were normal insofar as strength and shade were concerned.

IV. Sulphur Balance on Kraft Lime Mud Liquor.

A sulphur balance was made on the lime mud liquor by determining the total amount of sulphur present after oxidation with sodium peroxide, in comparison with the sulphur present as sulphur dioxide and sulphur trioxide. No abnormal lime-sulphur compounds were found by qualitatively testing the cooking liquor prepared from kraft lime mud. Table II shows the values obtained in grams per cc. of bisulphite liquor.

TABLE II.—SULPHUR BALANCE ON KRAFT LIME MUD COOKING LIQUOR

S as SO_2	S as SO_3	S as $SO_2 + SO_3$	S by Oxidation	Difference
0.0265	0.0004	0.0269	0.0272	0.0003
0.0369	0.0005	0.0374	0.0378	0.0004

V. Analysis of the Sludge Insoluble in the Bisulphite Liquor.

The sludge insoluble in sulphur dioxide and water amounted to about three per cent of the oven-dry weight of the original lime mud. The results of the analysis, based on the oven-dry weight of the lime mud which was sulphited, are given in Table III. The oxides of iron and aluminum were taken as that portion which was precipitated from the hydrochloric acid soluble fraction by ammonium hydroxide, and determined by heating the precipitate in a muffle furnace. The hydrochloric acid insoluble portion may have been contaminated with some wood, as a low percentage of small wood chips was present in the lime sludge. The portion insoluble in hydrochloric acid was assumed to be carbon and sand. The noncombustible was considered to be silica. Due to the small amount of iron and aluminum present, no attempt was made to separate the two.

VI. Sulphiting of Ferric Hydroxide and Ferrous Sulphide.

To determine the reaction of ferric hydroxide and ferrous sulphide towards sulphur dioxide gas, these compounds were made from a solution of ferric sulphate, and water suspensions of the washed precipitates were separately sulphited by sulphur dioxide gas. The ferric hydroxide was dissolved. On boiling, the ferric hydroxide was again precipitated as a basic ferric sulphate. The ferrous sulphide was also dissolved, with the formation of colloidal sulphur; this sulphur was precipitated on boiling. A portion of the ferrous sulphide was dried in an oven at 105 deg. C. and was treated with sulphur dioxide gas. Sulphur was again formed. These experiments indicated that iron present in the lime mud went into solution when treated with sulphur dioxide, but that any free sulphur might be removed by filtering. Colloidal sulphur, admixed with slaked lime and the mixture then sulphited, does not dissolve to form a complex acid, such as a thiosulphate. The resulting solution, when acidified with hydrochloric acid, does not show the presence of colloidal sulphur.

TABLE III.—ANALYSIS OF INSOLUBLE SLUDGE FROM COOKING LIQUOR PREPARED FROM KRAFT LIME MUD

HCl insoluble, per cent	2.72
Non-combustible, per cent	0.19
$Fe_2O_3 + Al_2O_3$, per cent	0.007

Heating and Ventilating Developments 1936–7*

By A. E. Montgomery[1]

The past year has seen a rapid progress in certain interesting drying, heating and ventilating developments. None of these may be classed as new developments, but the rapid increase in interest attending them is noteworthy.

Perhaps first place may be given to the use of moisture indicating and control mechanisms in connection with drying on the paper machine. These systems have had most prominent application to fourdrinier papers, but systems have been developed which show promise on heavier papers.

Whereas the moisture control systems are for the purpose of bringing the paper off the paper machine with a constant moisture content, they alone cannot necessarily insure that the paper will reach the printer with the desired moisture content. With many papers it is desirable to have greater moisture than can be carried off the driers or run through the calender stacks. The past year has seen much effort exerted on this problem of delivering the paper to the printer with the best moisture content. At least one paper mill with a moisture control system on the paper machine has added equipment which will increase the moisture content of the paper under controlled conditions following the drying operation, and further, has provided complete air conditioning winter and summer in the finishing, packing, and storage rooms.

The past year has seen a more widespread interest than ever before in the use of air heaters as condensers of prime movers and as condensate coolers. New arrangements of air heating surface have been developed better adapted than any previously available for this purpose.

During the past year the first air dryer for sheet pulp has been purchased in this country. While a new development here, these fan driers have been operated in several mills in Sweden in recent years.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 22-25, 1937.

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Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Sizing

Sizing Paper. Otto Kress and Charles E. Johnson, assignors to The Institute of Paper Chemistry. U. S. pats. 2,059,464 and 2,059,465 (Nov. 3, 1936.)—*No. 2,059,464*—Sized paper containing an alkaline filler is obtained by using an alkaline filler the particles of which have first been sized or coated with a substance (preferably paraffin) which is inert to the rosin-size reagents. *No. 2,059,465*—A waxy or paraffin emulsion, which has been stabilized by means of a protein (such as soy bean milk or milk casein) and containing an emulsifying agent such as ammonium oleate, is applied to a sheet of paper, either during formation (on a cylinder or fourdrinier machine), after formation but while still moist, or after drying.—A.P.-C.

Sizing Paper. Otto Kress and Charles E. Johnson, assignors to The Institute of Paper Chemistry. U. S. pat. 2,058,085 (Oct. 20, 1936).—Paraffin is emulsified by means of a soluble soap and the emulsion is stabilized by means of a protein material such as milk casein or soy bean casein. The emulsion is added to the beater furnish and is broken by means of an acid-reacting substance such as alum.—A.P.-C.

Method of and Apparatus for Sizing Photographic Paper. Gerould T. Lane, assignor to Eastman Kodak Co. U. S. pats. 2,059,880 and 2,059,881 (Nov. 3, 1936). —The paper is led through a stream of flowing live steam and then immediately through a relatively cool sizing bath. *No. 2,059,880* covers the method and *No. 2,059,881* an apparatus for carrying it out.—A.P.-C.

Sizing Paper Containing Alkaline Fillers. Harold R. Rafton, assignor to Raffold Process Corp. U. S. pat. 2,056,209 (Oct. 6, 1936).—This is a modification of Rafton's U. S. pats. 1,803,646 and 1,803,649, and provides for the use as sizes of saponifiable materials (preferably rosin) in completely or preponderantly unsaponified form, which has the advantage of reducing the tendency to foaming.—A.P.-C.

Treatment of Pulp. Pierre Delcroix, assignor to Papeteries Navarre. U. S. pat. 2,061,935 (Nov. 24, 1936).—The pulp is pre-sized by treating with paraffin, suitably on a pulp-drying machine.—A.P.-C.

Fillers and Coating Materials

Effect of Mineral Fillers on the Serviceability of Coating Asphalts. O. G. Streiter. Am. Soc. Testing Materials, Proc., 1936, Preprint 84. 7 p. Building Sci. Abstr. 9:195—Asphalt shingles and roofing felts are manufactured by impregnating felt with a relatively soft asphalt and applying a surfacing of a considerably harder asphalt usually containing a filler—finely ground slate, limestone, or other similar materials. The effectiveness of fillers in improving the weather resistance of such products has been studied in an investigation in which unfilled asphalts and 57 asphalt-filler mixtures containing various proportions by weight of powdered slate, dolomite, limestone, silica sand, hydrated lime, mica or talc were applied either to sheet aluminum or to a saturated felt and exposed outdoors in various localities and to an accelerated weathering test. In general, the presence of fillers improves the weather resistance. Although all the fillers tested were not equally effective, the results were not sufficiently definite to lead to any conclusions regarding one type of filler as compared with another.—C.J.W.

Effect of Titanium Dioxide on the Sizing of Paper. J. Alfred Bicknell. Pulp Paper Mag. Can. 37:688-689 (Nov., 1936).—Regardless of the amount of rosin size and alum used, titanium dioxide does not reduce the sizing resistance to water penetration when compared with clay or calcium carbonate. With calcium carbonate the sizing is nil regardless of the amount of rosin size and alum present. The use of potassium permanganate instead of Carson's dry indicator gives results that are intermediate between and more accurate than those of the ink flotation test and the dry indicator test, the former giving high results and the latter low results.—A.P.-C.

Progress in Paper Filling. A. E. H. Fair. Paper Trade J. 103, No. 21; 35-36 (Nov. 19, 1936).—A brief review of the more interesting recent developments in the use of china clays, titanium pigments, zinc sulphide pigments and carbonates, with a brief discussion of the most important factors affecting retention of fillers.—A.P.-C.

Titanium Pigments. William R. Willets. Paper Trade J.103, No. 21:43-45 (Nov. 19, 1936).—A review of their manufacture, characteristics and use in paper manufacture.—A.P.-C.

The Viscosity of Casein Solutions. Papeterie 58: 921-922 (Oct. 25, 1936).—The influence of concentration, *p*H, alkalies, neutral salts, impurities, process of preparation and addition of other colloids on the viscosity of casein solutions is briefly pointed out.—A.P.-C.

Coating Composition. Herbert A. Winkelmann, assignor to Marbo Products Corp. U. S. pat. 2,046,987 (July 7, 1936).—A rubber hydrochloride is milled with a basic stabilizer such as magnesia and the mixture is dispersed in a solvent such as toluene to obtain a paper-coating composition.—A.P.-C.

Coating Compositions Containing Deacetylated Chitin. Gordon D. Patterson and James H. Peterson, assignors to E. I. du Pont de Nemours and Co. U. S. pat. 2,047,220 (July 14, 1936).—Materials such as wall paper are coated with an aqueous dispersion containing a salt, such as the acetate of deacetylated chitin in solution, together with pigments, fillers, etc. Numerous examples are given.—A.P.-C.

Paper Manufacture. Harold R. Rafton, assignor to Raffold Process Corp. U. S. pat. 2,060,824 (Nov. 17, 1936).—Paper containing alkaline filler, prepared according to Rafton's U. S. pat. 1,914,526, of June 20, 1933, sometimes causes difficulty owing to the adverse effect of the alkaline filler at or near the surface of the

paper, either on certain inks or colors, or in certain processes, such as the lithographic process. This is overcome, according to the present invention by applying a non-alkaline filler to the surface of the web containing alkaline filler.—A. P.-C.

Fillers and Coating Materials

Swelling Starches. M. Blinc and M. Samec. Kolloid-Z. 77, No. 1:134-140 (Oct., 1936).—The article discusses the principle of swelling starches and the different patents covering their preparation. A bibliography with 63 patent references is appended.—C.J.W.

Advances in the Field of the Chemistry of Polysaccharides. II. Starch. Chem.-Ztg. 60, No. 84:853-857; No. 86:875-876 (Oct. 17, 24, 1936).—The author presents a review of the researches on starch during the past ten years, with special reference to the structural chemistry, the identity of starches from various sources, the evidence for the nature of the linkages within the molecule (based on hydrolysis products, the kinetics of the hydrolysis and its optical activity), the fermentative degradation, the size and form of the molecule, and closes with a brief discussion of unsolved problems of starch chemistry, such as the nature of the phosphorus in the molecule.—C.J.W.

Glue Vehicles for Coating Compositions. Ohl. Kunstdunger u. Leim 33:79-82 (1936); C. A. 30:8678.—The use of glue, casein and vegetable protein in making compositions for coating paper is reviewed with a number of practical examples.—C.J.W.

Casein Solutions. Carl Iddings, assignor to The Muralo Co., Inc. U. S. pat. 2,047,143 (July 7, 1936).—A stable solution retaining its viscosity over long periods of time is obtained by adding to a stable casein solution a water-soluble soap such as the ammonium soap of a glycerol-phthalate resin (suitably in an amount about 30 per cent of the weight of the casein present).—A.P.-C.

Dyes

Metanil Yellow: A Standard Paper Color. Maurice Déribéré. Papeterie 58:866, 869 (Oct. 10, 1936).—A brief outline of its merits and of the manner of using it for coloring paper.—A.P.-C.

Drying

Drying upon the Paper Machine. Papier-Ztg. 61, No. 60:1134-1135 (July 25, 1936).—The author shows the relationship between strength properties of the paper and sufficient actual drying surface; the more gradual the process, the better the resulting strength properties. Fewer drying cylinders necessitate lower paper machine speeds when identical strength results are desired. The importance of uniform moisture conditions in testing rooms is stressed. An example is given, according to which variations of 1 per cent above or below the standard moisture content resulted in variations of 200 and even more double folds.—C.J.W.

The Control of Air in Machine Room Ventilation and Drying. H. G. Rappolt. Paper Trade J. 103, No. 18: 123-124 (Oct. 29, 1936); Pulp Paper Mag. Can. 37:659-696, 731 (Nov., 1936).—A brief discussion of the amount of air required for heating and drying in the paper machine room and of its control.—A.P.-C.

Flat Box Vacuum Control on Fourdrinier with or without Barometric Legs. A. E. Broughton. Paper Trade J. 103, No. 18:90, 92 (Oct. 29, 1936).—An explanation of the new Broughton system.—A.P.-C.

Condensate Remover for Paper Machine Driers. Adam E. Bridge, assignor to The Black-Clawson Co. U. S. pat. 2,056,562 (Oct. 6, 1936).—The condensate-removal pipe is held in an elongated support that holds the pipe at widely separated points so that it does not sag or loosen. The device comprises a condensate-withdrawal pipe and a depending extension connected by a hinge connection so constructed as to provide limited lateral swinging of the pipe extension and permitting the extension to swing up into approximate alignment with the pipe, so that the latter may be readily applied to or removed from the supporting fitting at the end of the roll journal without disturbing the position of the fitting or without stopping the drier roll.—A.P.-C.

Paper Making Machine. Edward J. Mellentine. U. S. pat. 2,060,945 (Nov. 17, 1936).—In order to improve the drying of the paper side of the drier felt and to remove wads and the like, at any suitable point or points in the drier section of the machine the felt is looped around two small rolls. In the loop of the felt are located steam or hot air coils and a trough for receiving particles of paper breaking off the web of paper.—A.P.C.

Paper Machinery. Albert H. Standley, assignor to Downington Manufacturing Co. U. S. pat. 2,062,238 (Nov. 24, 1936).—The working surface of the felt, in contact with the paper, is cleaned and surfaced by passing over a lightly constructed suction roll offering low friction resistance, that is driven by its contact with the felt.—A.P.-C.

Process and Apparatus for the Drying of Traveling Webs. Otto Merckens. U. S. pat. 2,061,976 (Nov. 24, 1936).—The drying cylinders are each surrounded by a wire screen or a perforated metal screen which is mounted so as to be only slightly spaced from the cylinder and to rotate therewith. Opposite the portion of the cylinder in contact with the paper web, hot, dry air is below into the space between the cylinder and the surrounding screen. The use of felts can be dispensed with.—A.P.-C.

Hydrogen-ion Concentration

Hydrogen-ion Concentration, Methods of Determination and pH values in the pulp and paper industry. E. Munds. Jahresbericht, Verein Zellstoff- u. Papier-Chemiker u. -Ing. 1935:16-25.—The author discusses the principles and measurement of hydrogen-ion concentration. The antimony, quinhydrone, and glass electrodes were compared in measurement of the pH of cooking liquor during the course of the sulphite cook. The inaccuracy of the antimony and quinhydrone electrode measurements under such conditions is pointed out. The relationship between actual and potential acidity of paper as measured by hydrogen-ion concentration and total acidity of the extracts, respectively, has been determined for eleven papers. The effect of time of extraction and of fiber concentration in measurement of the pH of the water extract of paper are summarized.—C.J.W.

Hydrogen Ion Concentration, Methods of Determination and pH Values in the Pulp and Paper Industry. Papier-Fabr. 34, No. 40:361-363 (Oct. 4, 1936).—In continuation of the previous investigation it was found that the *p*H values of water extracts of five different papers were independent of time of extraction from 20

minutes to three hours. The extractions were made at 92° and do not agree in result with the work by Haug who boiled the liquid during extraction. Extractions with normal potassium chloride when compared to corresponding water extracts gave higher *p*H values in cold and lower *p*H values in hot extractions.—C.J.W.

Paper-Properties

General Properties of Some Chinese and Imported Papers. Tao-Yuan Tang. J. Chem. Eng. (China) 3:124-130 (1936); C. A. 30:7845.—The weight per square meter, composition (kind of fiber), tensile strength, folding strength, bursting strength, expansion and contraction, gloss, opacity contrast ratio, thickness and ash content are reported for seventeen different kinds of Chinese and imported papers.—C.J.W.

Moisture Content During Conversion of Paper. Papier-Ztg. 61, No. 84:1580, 1582; No. 85:1597-1598 (Oct. 17, 21, 1936).—Reference is made to the influence of the moisture content upon the behavior and physical properties of paper. A table is included listing the moisture contents of different kinds of paper and board at certain relative humidities between 10-90 per cent. The necessity of correct paper conditioning for printing, creping, certain cutting or stamping operations, dyeing, pasting, folding, etc., is pointed out and illustrated by examples. The need for a mutual understanding between paper maker and converter is stressed.—C.J.W.

Why Air Conditioning of Paper Storage and Finishing Rooms. Finnish Paper and Timber J. 18, No. 19: 950, 952, 954, 956 (Oct. 15, 1936). The importance of proper air conditioning in paper storage rooms and printing plants is explained. The influence of humidity upon certain physical properties of the paper, such as size resistance, bursting strength, folding endurance, tensile strength, etc., is discussed.—C.J.W.

Envelopes with Curling Flaps. Papier-Ztg. 61, No. 74:1408 (Sept. 12, 1936).—A converting plant asks for remedies against the curling of the flaps of envelopes after gumming. Incorrect moisture content of the adhesive or improper drying, too dry paper, or paper cut in the machine direction instead of the diagonal grain, are listed as some of the possible reasons of this defect. —C.J.W.

Curling of Small Sheet. E. Kenneth Hunt. Graphic Arts Monthly 8, No. 11:36, 52, 54 (Nov., 1936).—An inquirer is asking for remedies for overcoming the tendency of curling in super book paper, which developed after cutting the large into smaller sizes. Before cutting the paper lay very flat. Cutting conditions, particularly the sharpness of the cutting knife, are given as possible reason of the trouble. The edge of the paper that comes away in front of the knife as it is cut, is always much rougher and more ragged than that behind the knife. This rough edge absorbs moisture much quicker than clean cut paper, while the weight of the paper in the pile will keep the air in the press room from getting very far into the sheet. Retrimming of the sheets and not piling the paper into too high stacks is suggested for avoiding the trouble. —C.J.W.

Pulp and Paper Testing

Sampling Pulp for Moisture Determination. Mon. Papeterie Belge 16:526-531 (Sept., 1936).—A description of the investigation carried out by J. Persoz in 1910 and which led to the adoption of the present French official method.—A.P.-C.

Analysis by Means of Fluorescent Indicators. Maurice Déribéré. Papeterie 58:877-881 (Oct. 10, 1936). —Attention is drawn to the advantages of fluorescent indicators in titrimetry and the method of using them is briefly indicated.—A.P.-C.

Standard Method for Evaluating Pulps with Regard to their Mechanical Parchmentizing properties. Method number 13. Fachausschuss U.-A. für Fasserstoofanalysen. Papier-Fabr. 34, No. 44:397-401 (Nov. 1, 1936). —A description of the German standard procedure and apparatus is given. The methods of beating, dilution, sheet formation, and drying are specified; the samples are then subjected to the blister test of Noll and Nagel (Papier-Fabr. 32:289 [1934]), and eventually to the fat penetration test with phthalic acid diethyl ester, and the absorptivity test of Noll and Bolz (Papier-Fabr. 32:465, 473 [1934]).—C.J.W.

Standard Method for the Determination of the Thickness and Bulk of Paper. L. G. Cottrall et al. Paper Makers' Assoc. Gt. Brit., Ireland, Special Bull., 23 pp. (June, 1936).—A micrometer, its calibration and a method for determining and reporting thickness of paper are discussed, together with the effect of influencing variables. Bulk is defined as the ratio of the volume of paper, measured at 65 per cent relative humidity and 18° to 21° C., to the volume of an equal weight of water measured at 4° C.—A.P.-C.

Rot in Roofing Felts. H. Walther. Vedag-Buch, Berlin, 1935:125-130; Building Sci. Abstr. 9:164.—Felts impregnated with tar or with tar-free asphaltic bitumen were tested, the former both bare and with sand surfacing. Control strips of each type were tested for tearing and bursting strength, and parallel specimens were buried in moist soil and similarly tested at intervals up to 22 days. It was found that, while both the bursting and tearing strengths of the asphaltic bitumen materials showed a steady loss with time of exposure, those of the bare tarred felts remained unchanged, and those of the tarred and sanded felts increased. The causes and practical significance of these phenomena are briefly discussed.—C.J.W.

Correction

Although this is a somewhat belated correction, it is published herewith for the benefit of the records. In the PAPER TRADE JOURNAL of December 3, 1936, page 47, Dr. Schwartz was quoted as follows: "This fabier (ramie) is one of the most perfect in structure and consequently not of value in textile or paper making, etc." It should read as follows: "This fiber is one of the most perfect in structure from the physical point of view, and is of value for this reason in connection with fundamental investigation on the problem of fiber structure both for textiles and for paper making and for the raw materials for use in rayon manufacture."

Felt Making Movies at University of Maine

The manufacture of paper machine felts, as illustrated in a talking motion picture, "Two Related Industries," was shown recently at the University of Maine, sponsored by the Department of Pulp and Paper Technology, and presented by Dick Stroud, a representative of F. C. Huyck & Sons, Kenwood Mills, Albany, N. Y.

Many of the neighboring pulp and paper mills were represented, as well as students in the Department of Pulp and Paper Technology.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING MAY 15, 1937

SUMMARY

Cigarette paper .....584 cs.
Wall paper ..... 11 bxs., 2 bls., 15 cs.
Wall board .....18 cs.
Paper hangings ..... 4 bls., 3 cs.
Painted paper ..... 13 bls.
Newsprint ..... 11,604 rolls
Printing paper .....261 bls., 433 rolls, 47 cs., 69 pkgs.
Wrapping paper .....3,873 rolls, 242 bls., 85 cs.
Silk packing paper .....102 casks, 1 cs.
Filter mass .....100 bls.
Filter compound ..... 100 bls., 20 cs.
Filter material ..... 25 bls.
Filter paper ..... 108 bls., 26 cs.
Drawing paper .....47 cs.
Surface coated paper ..... 36 crates, 273 cs.
Baryta coated paper ..... 28 crates
Metal coated paper ..... 35 cs.
Basic paper ..... 7 cs.
Photo paper ..... 13 cs.
Decalcomania paper ..... 27 cs. (duplex)
Decalcomanias ..... 27 cs.
Transfer pictures ..... 33 cs.
Tissue paper ..... 8 cs.
Colored paper ..... 4 cs.
Boards ..... 23 bls.
Wood pulp paper ..... 10 cs.
Waxed paper ..... 2 cs.
Gummed paper ..... 9 cs.
Paper tubes ..... 183 cartons, 206 cs.
Straw board .....327 bdls., 400 rolls
Miscellaneous paper ..... 363 rolls, 718 bls., 183 cs.

CIGARETTE PAPER

Gluckman & Strauch, *Exeter,* Marseilles, 2 cs.
——, *Exeter,* Marseilles, 56 cs.
R. J. Reynolds Tobacco Co., *Manhattan,* Havre, 266 cs.
Champagne Paper Corp., *Manhattan,* Havre, 260 cs.

WALL PAPER

F. Blank, *Pr. Roosevelt,* Havre, 4 cs.
F. J. Emmerich, *Pr. Roosevelt,* Havre, 1 cs.
S. K. Lonegren, *Drottningholm,* Gothenburg, 11 bxs.
——, *Europa,* Bremen, 4 cs.
F. Blank, *Manhattan,* Havre, 6 cs.
F. J. Emmerich, *Hansa,* Hamburg, 2 bls.

WALL BOARD

Treetex Corp., *Drottningholm,* Gothenburg, 18 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Banker,* London, 4 bls., 3 cs.

PAINTED PAPER

——, *Ile de France,* Havre, 13 bls.

NEWSPRINT

Jay Madden Corp., *Hamburg,* Hamburg, 516 rolls.
Perkins Goodwin & Co., *Hamburg,* Hamburg, 200 rolls.
——, *Pr. Roosevelt,* Hamburg, 49 rolls.
H. G. Craig Co., *Newscarrier,* Donnacona, 332 rolls.
H. G. Craig Co., *Donnacona, I,* Montreal, 487 rolls.
H. G. Craig Co., *Donpaco,* Donnacona, 319 rolls.
International Paper Sales Co., *New Westminster City,* Dalhousie, 2302 rolls.
International Paper Co., *New Westminster City,* Dalhousie, 6083 rolls.
News Syndicate Co., *G.T.D.,* Gatineau, 300 rolls.
Jay Madden Corp., *Manhattan,* Hamburg, 169 rolls.
Jay Madden Corp., *Hansa,* Bremen, 353 rolls.
Perkins Goodwin & Co., *Hansa,* Hamburg, 494 rolls.

PRINTING PAPER

Jay Madden Corp., *Manhattan,* Hamburg, 43 bls., 72 rolls.
——, *Manhattan,* Hamburg, 350 rolls, 218 bls.
Coty Processing Co., *Manhattan,* Havre, 5 cs.
E. Dietzgen & Co., *Hansa,* Hamburg, 37 cs.
Dingelstedt & Co., *Hamburg,* Hamburg, 69 pkgs.
Japan Paper Co., *Port Adelaide,* London, 1 cs.
International F'd'g. Co., *J. Jadot,* Antwerp, 4 cs.
Keuffel & Esser Co., *Manhattan,* Hamburg, 11 rolls.

WRAPPING PAPER

E. Dietzgen & Co., *Hamburg,* Hamburg, 47 cs.
Keller Dorian Paper Co., *Exeter,* Marseilles, 27 cs.
——, *Drottningholm,* Gothenburg, 3100 rolls.
Guaranty Trust Co., *Drottningholm,* Gothenburg, 504 rolls, 188 bls.
——, *Hansa,* Hamburg, 11cs., 54 bls., 259 rolls.

SILK PACKING PAPER

Jay Madden Corp., *Pr. Roosevelt,* Hamburg, 1 cs., 102 casks.

FILTER MASS

A. W. Fenton, Inc., *Pr. Roosevelt,* Hamburg, 100 bls.

FILTER COMPOUND

Globe Shipping Co., *Hamburg,* Hamburg, 20 cs.
——, *Hansa,* Hamburg, 100 bls.

FILTER MATERIAL

F. Bing, *Black Falcon,* Rotterdam, 25 bls.

FILTER PAPER

J. Manheimer, *Aquitania,* Southampton, 98 bls., 1 cs.
H. Reeve Angel & Co., Inc., *Port Adelaide,* London, 11 cs.
E. H. Sargeant & Co., *Drottningholm,* Gothenburg, 14 cs.
Orbis Products Trading Co., *Manhattan,* Southampton, 10 bls.

DRAWING PAPER

Lansen Naeve Corp., *Europa,* Bremen, 4 cs.
Keuffel & Esser Co., *Manhattan,* Hamburg, 41 cs.
——, *Manhattan,* Havre, 2 cs.

SURFACE COATED PAPER

Gevaert Co. of America, *Black Falcon,* Antwerp, 171 cs.
Gevaert Co. of America, *Pennland,* Antwerp, 96 cs.
C. Happel, Inc., *Pr. Roosevelt,* Hamburg, 6 cs.
Globe Shipping Co., *Hansa,* Bremen, 36 crates.

BARYTA COATED PAPER

Globe Shipping Co., *Hamburg,* Hamburg, 28 crates.

METAL COATED PAPER

K. Pauli Co., *Hamburg,* Hamburg, 20 cs.
K. Pauli Co., *Hansa,* Bremen, 15 cs.

BASIC PAPER

Globe Shipping Co., *Hansa,* Bremen, 7 cs .

PHOTO PAPER

American Express Co., *American Banker,* London, 10 cs.
Medo Photo-Supply Co., *Aquitania,* Southampton, 3 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Samaria,* Liverpool, 27 cs. (duplex).

DECALCOMANIAS

Sellers Transportation Co., *Europa,* Bremen, 25 cs.
——, *Europa,* Bremen, 2 cs.

TRANSFER PICTURES

Rolmer Gehrig & Co., *Europa*, Bremen, 33 cs.

TISSUE PAPER

Atlantic F'd'g Co., *Hamburg*, Hamburg, 8 cs.

COLORED PAPER

D. C. Andrews & Co., *Europa*, Bremen, 4 cs.

BOARDS

Salwen Paper Co., *Drottningholm*, Gothenburg, 23 bls.

WOODPULP PAPER

A. Goese & Son, *Veendam*, Rotterdam, 10 cs.

WAXED PAPER

R. U. Delapenha & Co., *American Banker*, London, 2 cs.

GUMMED PAPER

Heemsoth Kerner Corp., *Europa*, Bremen, 9 cs.

PAPER TUBES

———, *Hansa*, Bremen, 39 cs., 183 cartons.
———, *Hamburg*, Hamburg, 167 cs.

STRAW BOARD

Balfour Guthrie & Co., *Veendam*, Rotterdam, 327 bdls.
A. Vuyk, *Black Gull*, Rotterdam, 400 rolls.

MISCELLANEOUS PAPER

Keuffel & Esser Co., *Hamburg*, Hamburg, 85 cs., 44 rolls.
Japan Paper Co., *Anna Maersk*, Kobe, 87 cs.
Favor Ruhl & Co., *Ile de France*, Havre, 3 cs.
De Manduit Paper Corp., *Ile de France*, Havre, 4 cs.
The Borregaard Co., Inc., *Drottningholm*, Gothenburg, 95 rolls, 549 bls.
———, *Drottningholm*, Gothenburg, 55 bls., 224 rolls.
F. L. Kramer & Co., *Drottningholm*, Gothenburg, 114 bls
H. C. Davison & Co., *Shinko Maru*, Tokio, 4 cs.

RAGS, BAGGINGS, ETC.

———, *Hamburg*, Hamburg, 117 bls. rags.
D. Benedetto, Inc., *American Banker*, London, 151 bls. bagging.
F. Stern, *Silverpine*, Bombay, 48 bls. rags, 49 bls. new cuttings.
Hicks Costarino & Co., *Silverpine*, Bombay, 176 bls. rags.
———, *Silverpine*, Bombay, 125 bls. rags.
E. J. Keller Co., Inc., *Silverpine*, ———, 56 bls. rags.
E. J. Keller Co., Inc., *Black Falcon*, ———, 87 bls. bagging.
Van Oppen & Co., *Black Falcon*, Antwerp, 123 bls. rags.
Irving Trust Co., *Black Falcon*, Antwerp, 19 bls. rags.
R. & V. Miller, Inc., *Black Falcon*, Antwerp, 21 bls. rags.
Guaranty Trust Co., *Black Falcon*, Antwerp, 56 bls. paper stock.
Great Eastern Packing & Paperstock Corp., *Veendam*, Rotterdam, 68 bls. bagging.
G. A. Henshaw & Son, *Liberty*, Hull, 12 bls. paper stock.
———, *Liberty*, Dundee, 75 bls. paper stock.
Darmstadt Scott & Courtney, *Liberty*, Dundee, 83 bls. paper stock.
Banco Coml Italiane Trust Co., *Tuscania*, Glasgow, 27 bls. rags, 40 bls. strings.
Darmstadt Scott & Courtney, *Batory*, Gdynia, 210 bls. rags.
R. Blank, *Black Gull*, Rotterdam, 162 bls. rags.
J. J. Ryan & Son, Inc., *Anna Maersk*, Kobe, 100 bls. cotton waste.
Linter Supply Co., *Anna Maersk*, Kobe, 100 bls. cotton waste.
E. J. Keller Co., Inc., *Anna Maersk*, ———, 473 bls. paper stock.
E. J. Keller Co., Inc., *Examelia*, ———, 212 bls. bagging, 795 bls. rags.
Hicks Costarino & Co., *Examelia*, Alexandria, 125 bls. rags.
R. Blank, *Examelia*, Alexanldria, 45 bls. cotton, 125 bls. rags.
———, *Examelia*, Alexandria, 1689 bls. rags.
E. J. Keller Co., Inc., *Harpefjell*, ———, 222 bls. flax waste.
J. Herber, *Orizaba*, Vera Cruz, 38 bls. rags.
A. W. Fenton, Inc., *Port Adelaide*, London, 106 bls. rags.
Manufacturers Trust Co., *J. Jadot*, Antwerp, 98 bls. jute waste.
———, *Exeter*, Beirut, 53 bls. rags.
E. J. Keller Co., Inc., *Exeter*, ———, 47 bls. rags.
R. & V. Miller, Inc., *Drottningholm*, Gothenburg, 10 bls. rags.
E. J. Keller Co., Inc., *Western Prince*, ———, 34 bls. hemp canvas.
Royal Manfg Co., *Shinko Maru*, Tsingtao, 43 bls. cotton waste.
New England Waste Co., *Shinko Maru*, Shanghai, 262 bls. cotton waste.
Linter Supply Co., *Shinko Maru*, Shanghai, 100 bls. cotton waste.
E. J. Keller Co., Inc., *Executive*, ———, 189 bls. paper stock.
Williamson Products Co., *Katsuragi Maru*, Kobe, 100 bls. cotton waste.
D. S. Stern Corp., *Katsuragi Maru*, Kobe, 150 bls. cotton waste.
Linter Supply Co., *Katsuragi Maru*, Kobe, 100 bls. cotton waste.
Loumar Textile By Products Co., *Katsuragi Maru*, Kobe, 50 bls. thread waste.
New England Waste Co., *Katsuragi Maru*, Kobe, 100 bls. cotton waste.
J. J. Ryan & Son, Inc., *Katsuragi Maru*, Kobe, 100 bls. cotton waste.
Royal Manfg. Co., *Pipestone County*, Havre, 40 bls. thread waste.
———, *Pipestone County*, Havre, 50 bls. cotton waste.
D. Benedetto, Inc., *Pipestone County*, Havre, 197 bls. rags.
Manufacturers Trust Co., *Pipestone County*, Dunkirk, 44 bls. rags, 120 bls. jute waste.
Van Oppen & Co., *Pipestone County*, Dundirk, 140 bls. rags.
———, *Exmoor*, Tunis, 95 bls. rags.
———, *Exmoor*, Casablanca, 617 bls. rags.
E. J. Keller Co., Inc., *Bretagne*, ———, 135 bls. bagging, 177 bls. rags.
R. Blank, *Bretagne*, Alexandria, 395 bls. rags.
W. Steck & Co., *Bretagne*, Alexandria, 129 bls. rags, 204 bls. bagging.
R. J. Ross & Co., Inc., *Bretagne*, Alexandria, 295 bls. rags, 211 bls. bagging.
———, *Bretagne*, Alexandria, 183 bls. rags, 98 bls. bagging.
———, *Bretagne*, Istanbul, 195 bls. rags.
E. J. Keller Co., Inc., *Besholt*, ———, 1000 bls. paper stock.
E. J. Keller Co., Inc., *Tai Shan*, ———, 40 bls. paper stock.
E. J. Keller Co., Inc., *Collamer*, ———, 33 bls. paper stock.
E. J. Keller Co., Inc., *Konigstein*, ———, 267 bls. paper stock.

BONE GLUE

G. van Gelder, *Black Falcon*, Antwerp, 208 bags.
———, *Hansa*, Hamburg, 400 bags.

OLD ROPE

Banco Coml Italiane Trust Co., *American Banker*, London, 98 coils.
Banco Coml Italiane Trust Co., *Tuscania*, Glasgow, 58 coils.
E. J. Keller Co., Inc., *Black Falcon*, ———, 53 coils.
E. J. Keller Co., Inc., *Black Gull*, ———, 53 coils.
W. Steck & Co., *Black Gull*, Rotterdam, 40 coils.

CHINA CLAY

Orbis Products Trading Co., *Samaria*, Liverpool, 25 casks.
English China Clays Sales Corp., *Samaria*, Liverpool, 29 casks, 160 bags.
Paper Makers Importing Co., Inc., *Aquitania*, Southampton, 35 casks.

WOOD PULP

J. Andersen & Co., *Pr. Roosevelt*, Hamburg, 260 bls. sulphite, 52 tons.
Bankers Trust Co., *Hamburg*, Hamburg, 83 bls. sulphite, 16 tons.
Parsons & Whittemore, Inc., *Hamburg*, Hamburg, 332 bls. wood pulp, 51 tons.
Castle & Overton, Inc., *Hamburg*, Hamburg, 1590 bls. wood pulp, 318 tons.
———, *Black Falcon*, Rotterdam, 400 bls. wood pulp, 80 tons.
Perkins Goodwin & Co., *Batory*, Gdynia, 1600 bls. wood pulp, 246 tons.
Perkins Goodwin & Co., *Shanalian*, St. George, N. B., 306 tons ground wood pulp.
D. M. Hicks, Inc., *Drottningholm*, Gothenburg, 240 bls. chemical pulp.
M. Sone, *Drottningholm*, Gothenburg, 254 bls. chemical pulp.
M. Sone, *Hansa*, Hamburg, 372 bls. wood pulp, 50 tons.
M. Sone, *Barbarigo*, Trieste, 636 bls. wood pulp.

(Concluded on page 58)

HIGHEST GRADE

CLAYS

PAPER MAKERS IMPORTING CO., INC. EASTON, PENNSYLVANIA, U.S.A.

COATING FILLING

POWDERED

EXCELSIOR FELTS

a product of

THE KNOX WOOLEN CO.

CAMDEN MAINE

BULKLEY, DUNTON & CO.

295 MADISON AVE. NEW YORK, N. Y.

CAledonia 5-5260 to 69

for WELDING *of Large Pieces*

THE answer to your Heavy Welding Problems. Put them up to us. Benefit by our experience in welding parts for the highest-powered Kaplan turbines ever built.

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APPLETON PULP MILL EQUIPMENT

DECKERS
PULP THICKENERS
PULP WASHERS
WET MACHINES
CYLINDER MOULDS
FLAT SCREENS
PUMPS • VALVES
AGITATORS

THE APPLETON MACHINE COMPANY · Appleton, Wisconsin

WOOD PULP BOARDS

Flexideal Dry Mat Co., *Pr. Roosevelt,* Hamburg, 48 bls.
———, *Hansa,* Hamburg, 80 bls.

WOOD PULP SHEETS

———, *Hamburg,* Hamburg, 100 cs., 55 bls.

ALBANY IMPORTS

WEEK ENDING MAY 15, 1937

Pagel Horton & Co., Inc., *Frode,* Gefle, 4555 bls. wood pulp.
Gottesman & Co., Inc., *Frode,* Gefle, 1000 bls. sulphite, 101 tons.
Tradesmans Natl Bank Trust Co., *Frode,* Norrsundet, 4625 bls. wood pulp.
Price & Pierce, Ltd., *Toledo,* Oslo, 2100 bls. unbleached sulphite.
Price & Pierce, Ltd., *Toledo,* Greaker, 2500 bls. bleached sulphite.
E. M. Sergeant Pulp & Chemical Co., Inc., *Toledo,* Drammen, 210 bls. chemical pulp.
Atterbury Bros., Inc., *Toledo,* Drammen, 2025 bls. chemical pulp.
The Borregaard Co., Inc., *Toledo,* Hurum, 220 bls. sulphate

PORTLAND IMPORTS

WEEK ENDING MAY 15, 1937

Gottesman & Co., Inc., *Sorvard,* Sweden, 12504 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING MAY 15, 1937

———, *Anna Maersk,* Shanghai, 400 bls. rags, 116 bls. cotton waste.
Royal Manfg. Co., *Shinko Maru,* Shanghai, 300 bls. cotton waste.
———, *Pipestone County,* Havre, 100 bls. bagging.
Ayres W. C. Jones Co., *Pipestone County,* Havre, 6 bls. rayon waste, 22 bls. cotton waste.
Royal Manfg. Co., *Pipestone County,* Havre, 40 bls. cotton waste .
G. W. Millar & Co., Inc., *Pipestone County,* Dunkirk, 77 bls. bagging.
Irving Trust Co., *Pipestone County,* Dunkirk, 85 bls. bagging.
W. Steck & Co., *Pipestone County,* Dunkirk, 75 bls. old rope.
———, *Pipestone County,* Dunkirk, 55 bls. rags.
Price & Pierce, Ltd., *Tampa,* ———, 300 bls. unbleached sulphite.

NEW LONDON IMPORTS

WEEK ENDING MAY 15, 1937

Gottesman & Co., Inc., *Malaren,* Sweden, 2500 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING MAY 15, 1937

J. M. Hagy Waste Works, *Silverpine,* Bombay, 16 bls. new cuttings.
Castle & Overton, Inc., *Argentino,* Buenos Ayres, 40 bls. dark cottons, 37 bls. old stockings, 40 bls. old cloths.
E. J. Keller Co., Inc., *Black Falcon,* ———, 46 bls. rags.
———, *Black Falcon,* Antwerp, 112 bls. rags.
———, *Liberty,* Hamburg, 17 bls. rags.
———, *Liberty,* Hamburg, 442 rolls, 49 bls. wrapping paper.
Castle & Overton, Inc., *Liberty,* Hamburg, 4165 bls. wood pulp, 837 tons.
M. Sone, *Liberty,* Hamburg, 639 bls. wood pulp, 96 tons.
Perkins Goodwin Co., *Liberty,* Hamburg, 647 bls. wood pulp, 100 tons.
Castle & Overton, Inc., *Liberty,* Dundee, 138 bls. paper stock.
———, *Liberty,* Dundee, 99 bls. paper stock.
Philadelphia National Bank, *Examelia,* Alexandria, 50 bls. rags.
Atterbury Bros., Inc., *Toledo,* Oslo, 480 bls. chemical pulp.
Atterbury Bros., Inc., *Toledo,* Tofte, 1800 bls. sulphite.
Mazer Paper Mills, Inc., *Toledo,* Drammen, 4200 bls. sulphite pulp.
Wilkinson Bros. Inc., *Toledo,* Drammen, 560 rolls newsprint.
Atterbury Bros., Inc., *Toledo,* Drammen, 250 bls. chemical pulp.
The Borregaard Co., Inc., *Toledo,* Hurum, 1344 bls. sulphate.
Paper Products Manfg Co., *Toledo,* Greaker, 1750 bls. sulphite.
Royal Manfg Co., *Belfast Maru,* Shanghai, 50 bls. cotton waste.
———, *Belfast Maru,* Kobe, 100 bls. cotton waste.
———, *Shinko Maru,* Kobe, 671 bls. rags, 100 bls. cotton waste.
J. T. Flannery, *Exmoor,* Casablanca, 96 bls. rags.
Philadelphia National Bank, *Bretagne,* Alexandria, 200 bls. rags.
E. J. Keller Co., Inc., *Bretagne,* ———, 139 bls. rags.
E. J. Keller Co., Inc., *Haukefjell,* ———, 75 bls. paper stock.
E. J. Keller Co., Inc., *Exchester,* ———, 146 bls. paper stock.
M. Sone, *Chemnitz,* Hamburg, 1267 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING MAY 15, 1937

Congoleum Nairn Co., *Liberty,* London, 176 bls. rags.
———, *Liberty,* London, 112 coils old rope.
G. A. Henshaw & Son, *Liberty,* Hull, 24 coils old rope.
S. Shapiro & Sons, *Examelia,* Alexandria, 12 bls. rags.
Atterbury Bros. Inc., *Toledo,* Brammen, 1080 bls. chemical pulp.
Atterbury Bros., Inc., *Toledo,* Tofte, 2340 bls. sulphite.
The Borregaard Co., Inc., Toledo, Hurum, 600 bls. sulphate.
Gottesman & Co., Inc., *Toledo,* Halden, 2400 bls. sulphite.
Sherman Bros., *Shinko Maru,* Yokohama, 300 bls. rags.
———, *Livenza,* Trieste, 1000 bls. wood pulp.
Bankers Trust Co., *Livenza,* Trieste, 181 bls. wood pulp.
Pagel Horton & Co., Inc., *Marpesia,* Sweden, 5500 bls. wood pulp.
Parsons & Whittemore, Inc., *City of Norfolk,* ———, 1309 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING MAY 15, 1937

Banco Coml Italiane Trust Co., *Anna Maersk,* Kobe, 230 bls. bagging.
National Bank of Commerce, *Anna Maersk,* Kobe, 600 bls. bagging.

NEW ORLEANS IMPORTS

WEEK ENDING MAY 15, 1937

S. Shapiro & Son, *Belfast Maru,* Kobe, 60 bls. rags.
Gottesman & Co., Inc., *Taurus,* Sweden, 16200 bls. wood pulp.

MONTREAL IMPORTS

WEEK ENDING MAY 15, 1937

Price & Pierce, Ltd., *Topdalsfjord,* ———, 2286 bls. unbleached sulphite, 6114 bls. unbleached sulphate.

Science On Parade

A comprehensive picture of the paper industry throughout history, "The Story of Paper," is being exhibited until Saturday, May 22, at the Maryland Academy of Sciences, 2724 North Charles street, Baltimore, Md.

Many by-products of the paper industry also will be on display. A small machine will be shown producing paper in a manner similar to that of a large factory. Each visitor will be given a sample of the paper which he has seen made.

The exhibit is the fourth of a series presented by the academy under the title "Science on Parade."

Sulphite Pulp Group to Meet

Morris W. Hedden, of the Racquette River Paper per cut into shapes at 30 per cent. This is at ariance Company, Potsdam, N. Y., will be Chairman of the Sulphite Pulp Group Meeting at the Annual Convention of the American Pulp and Paper Mill Superintendents Association, June 23, 24 and 25 at Springfield, Mass.

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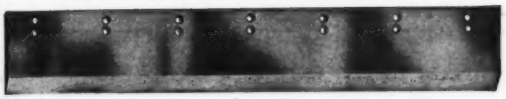

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New Electrically-Operated Flow Meter

A new electrically operated flow meter known as the Synchro-Meter has been developed by Bailey Meter Company, Cleveland, Ohio. Basically, the Synchro-Meter consists of a transmitting unit which is operated by a Ledoux bell flow measuring mechanism of the type used in standard Bailey mechanically-operated fluid meters, and a receiver consisting of the indicating, recording and integrating instruments. The transmitter is located at the point of measurement of the variable and the receiver is located at a place or places convenient for obtaining readings from the instruments as frequently as desired.

A number of distinct advantages characterize the Synchro-Meter. For example, the transmitter places only a negligible retarding force on the measuring device. Furthermore, the torque developed to operate the receiving element is very large and does not send any reaction back to the transmitter. No adjustments of the Synchro-Meter are necessary at the transmitting end. It may, therefore, be located in a relatively inaccessible place. Several receivers may be operated from one transmitter.

Metalastic Packings Catalog

The Metalastic Manufacturing Corporation, Hackensack, N. J., originators and manufacturers of high quality packings for an exceptionally wide range of stuffing box services, have just issued an excellent descriptive and pictorial catalog.

An interesting Foreword tells about the outstanding Metalastic successes ever since the organization of the company in 1922. In their own Research Laboratory they have developed not only packings but much of the special equipment to facilitate economical manufacture.

Photographs show numerous sizes and types of formed-ring packings, first developed by Metalastic, and on which they hold basic patents. The catalog shows Metalastic Coils, how to pack high pressure steam valves, steam heating valves, water faucets, swing joints, gasoline generating lamps, and refrigerating equipment. A page is also devoted to Metalastic Bulk Packings.

Finally there is a page of Metalastic Facts, a handy table for converting common fractions into decimals and millimeters, a page of mensuration formulae, and an outline of Metalastic Services.

New Howard Paper Folder

"Acceleration," an attractive folder recently released by The Howard Paper Company, Urbana, Ohio, is a beautiful piece of printing on Howard Bond. It contains some stimulating advice as well as several specimen letterheads as examples of what can be accomplished where Howard Bond is coordinated with effective design for appearance improvement.

This is one of a series of such folders the company is planning to release this year. The first one was "Rehabilitation." All users of paper wishing to receive these Howard Bond pieces should write to The Howard Paper Company, Urbana, Ohio.

Laboratory Microscopes

The Bausch & Lomb Optical Company, of Rochester, N. Y., has just issued a new catalog which concisely describes and illustrates its laboratory microscopes and accessories.

Standard Silicate Alkalies

The grades of silicate of soda and other silicated alkalis manufactured by the Standard Silicate Division of the Diamond Alkali Company, with their chemical properties, major uses and general information to acquaint users with the materials, are listed in a new booklet just published.

Silicate of Soda is a general term applied to a group of commercial materials all composed of different proportions of Sodium Oxide (Na_2O) and Silica (SiO_2).

The ratio or proportions of Sodium Oxide to Silica may be varied from one part of Sodium Oxide and four parts of Silica up to two parts of Sodium Oxide and one part of Silica. The concentration or moisture content may also be varied.

By carefully controlling these two factors, the manufacturer is able to make various grades of silicate of soda having a wide range of physical and chemical properties. These properties make silicate of soda useful in a large number of industrial processes.

American Cyanamid Changes

The following additions to the Technical Sales Service staff of the American Cyanamid and Chemical Corporation have been made.

Andrew W. Foley will be attached to the Southern District, with headquarters at the Charlotte, N. C. office. Mr. Foley is a member of TAPPI and at present vice president of the Southeastern Division of the American Pulp and Paper Mill Superintendents Association. Mr. Foley attended Niagara University.

Justus C. Barthel will make his headquarters at the main office of the corporation in New York. Mr. Barthel is a member of TAPPI and lately was technical assistant with the Institute of Paper Chemistry at Appleton, Wis. He is a graduate of Syracuse University.

A. E. Griffin will be attached to the Philadelphia District with headquarters at the Philadelphia Office. Mr. Griffin is a member of TAPPI and a graduate of Brown University.

New Foster Wheeler Bulletin

The Foster Wheeler Corporation has just published the first piece of literature to describe the new type "S" stainless steel bellows expansion joint.

This bulletin describes the forms in which the joint is regularly produced for pressures up to and including 150 lb. per square inch. By the use of suitable flanges these same joints are good for an operating pressure of 200 lb. per square inch.

For high pressure work a modification of the bellows is employed and the joints are then suitable for 300 lb. working pressure. In all cases the service includes operating temperatures up to 750 deg. F.

Nash Engineering Co. Bulletin

The Jennings Manifold Type Vacuum Heating Pump for return line vacuum heating systems, or any service where a liquid and a gas are handled together, is concisely described and illustrated in Bulletin No. 264 just issued by the Nash Engineering Company, of South Norwalk, Conn.

The ORIGINAL self-dispersing Pigment Blues for tinting:

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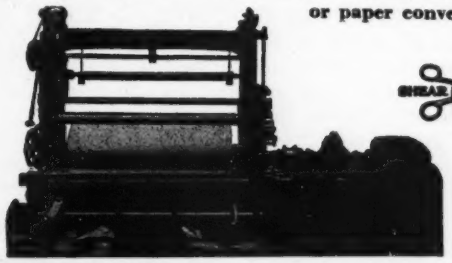

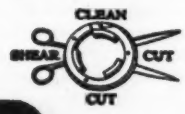

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Manufacturers of paper converting machinery for all purposes.

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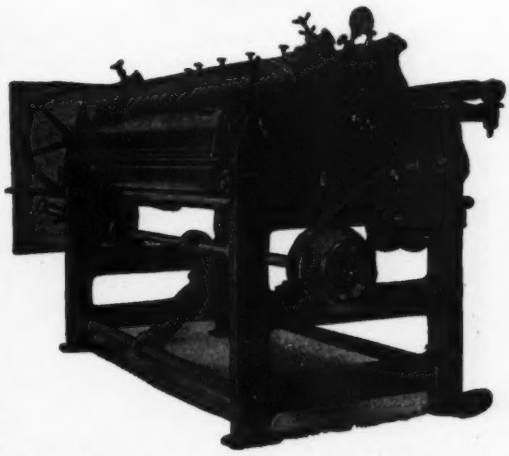

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, May 19, 1937.

The position of the local paper market is practically unchanged. Demand for the various standard grades of paper is well sustained. The contract movement is up to average. Shipments against contract are moving freely. Prices are generally holding to formerly quoted levels.

R. S. Kellogg, secretary of the News Print Service Bureau, announces that production in Canada during April amounted to 298,347 tons and shipments to 310,614 tons. The U. S. output was 78,642 tons and shipments 84,992 tons. During April 30,793 tons were made in Newfoundland so that North American production for the month amounted to 407,782 tons.

The fine paper market continues fairly buoyant. Demand for book, cover, bond and ledger papers is well sustained. Prices are steady to firm. Tissues are moving freely. The coarse paper market is strong with kraft specialties going forward into consumption freely. Paper board is fairly steady.

Mechanical Pulp

Conditions in the ground wood pulp market are somewhat steadier. Manufacturing operations in the United States, Canada and abroad are keyed to consumption as far as possible with a view to meeting current requirements. Shipments against contract are going forward in satisfactory volume.

Chemical Pulp

The chemical pulp market is holding up fairly well for the time of year. Recently revised quotations on domestic and imported chemical pulp are generally well maintained. Prime easy bleaching sulphite pulp and strong unbleached sulphite pulp are little changed. Bleached kraft pulp is stronger.

Old Rope and Bagging

Paper mill demand for old rope is irregular. Domestic and imported old manila rope is in somewhat moderate request. Small mixed rope is moving in fair volume. Old rope quotations are steady. The bagging market is moderately active. Gunny and scrap bagging are in fair request.

Rags

The domestic rag market is rather quiet at present. Demand for new and old cotton rags is somewhat moderate. There is some export interest developing in new cotton cuttings. Roofing grades are still in moderate request. The imported rag market is normal with prices nominal.

Waste Paper

Trading in the paper stock market is somewhat quieter. Demand for the higher grades from the paper mills is well sustained, however, especially for hard and soft white shavings and envelope cuttings. Book stock is steadier. Board mill demand for the lower grades is falling off slightly.

Talc

The talc market is holding its own. Demand for the various varieties is generally well sustained. The contract movement is normal. Prices are generally holding to formerly quoted levels and quotations are well maintained. Shipments are moving into consumption freely.

New De Laval Publication

How fuel costs in the generation of power can often be reduced by 25 to 50 per cent, or more, is pointed out in a paper entitled "Power and Heat Problems Yield to Improved Alloys and Designs", C. R. Waller, Vice-President in Charge of Engineering, of the De Laval Steam Turbine Company, Trenton, N. J.

Recent improvements in the design of steam turbines, and in the materials used for their production, permit of using steam in the region of high pressures and temperatures.

As little additional fuel is required for the generation of steam at high pressure, the efficiency of condensing steam plants can in this way be greatly increased.

Where steam is used for processing or heating, even at relatively high pressures, large amounts of power can also be obtained as a by-product, using the turbine as a pressure reducer and heat distributor. The possible savings with steam at various pressures and temperatures are presented in a table.

New Fairbanks-Morse Bulletins

Fairbanks-Morse Fig. 5870 Ball Bearing Centrifugal Pumps are illustrated and described in a new Bulletin No. 5870. These compact, sturdy pumps are built especially for operating at high speeds against heads up to 245 ft., with capacities of from 90 to 225 U. S. gallons per minute.

The new Fairbanks-Morse Bulletin 5814F describes that company's Ball Bearing Centrifugal Pumps. These have been especially designed to fully satisfy the exacting requirements of, and have been approved by, the National Board of Fire Underwriters and the Associated Factory Mutual Fire Insurance Companies.

Fairbanks-Morse Simplex Self-Oiling Power Pumps, described in the new F-M Bulletin 6150, have design and operating principles that make them especially suitable for pumping water, oil and similar liquids at pressures up to 300 pounds per square inch and in quantities up to 29 U. S. gallons per minute. Each is a complete Fairbanks-Morse product covered by one guaranty.

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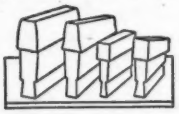

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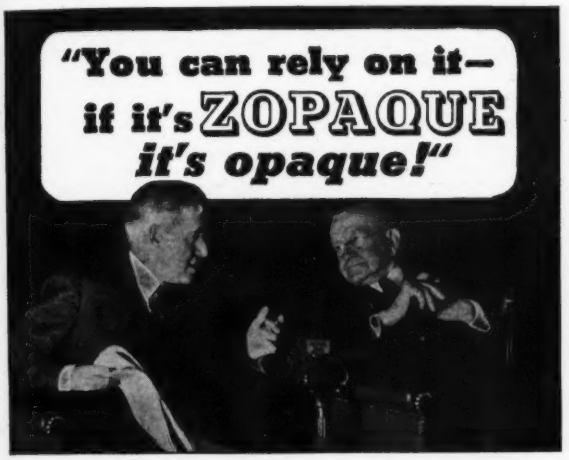

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ASH CONVEYORS——————STOKERS

THE FREDERICK IRON & STEEL CO.
FREDERICK, MARYLAND

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, May 19, 1937.

BLANC FIXE—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Conditions in the bleaching powder market are satisfactory. The contract movement is well up to average. Prices are maintained at formerly quoted levels. Bleaching powder is offered at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market is somewhat easier. Domestic standard ground casein is quoted at from 13½ to 14 cents per pound; while domestic finely ground casein is selling at from 14 to 14½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—Steadiness prevails in the caustic soda market. The contract movement is normal. Prices are steady. Solid caustic soda is quoted at from $2.55 to $2.60; while the flake and ground are selling at from $2.85 to $3 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is displaying strength. Shipments against contract are moving freely. Imported china clay is quoted at from $15 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE—Business in the chlorine market is holding up well. The contract movement is normal for the season. Prices are maintained at formerly quoted levels. Chlorine is selling at from $2.15 to $2.25 per 100 pounds, in tank cars, at works.

ROSIN—The rosin market is little changed. Paper making gum rosin is now quoted at $8.30 and wood rosin at $8.50 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $3.70 per 100 pounds, in tank cars, at works.

SALT CAKE—Demand for salt cake is persistent. Prices are steady and unchanged. Salt cake is quoted at from $12 to $13; chrome salt cake at from $11 to $12 per ton, at works; while imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH—The soda ash market is fairly buoyant. Demand from the paper mills is insistent. Prices are holding to schedule. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH—Offerings of starch are moving into consumption in good volume. The contract movement is normal. Prices are steady. Special paper making starch is quoted at $4 per 100 pounds, in bags; and at $4.27 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA—The sulphate of alumina market is stronger. Contract shipments are moving freely. Commercial grades are quoted at from $1.35 to $1.60; while iron free is selling at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market is steady. Yearly contracts are quoted at $18 per long ton on orders of 1,000 tons, or over and $20 on smaller quantities. On spot and nearby car loads the quotation is $21 per ton. All quotations are in car lots, at works.

TALC—Paper mill demand for talc is moderately active. In most instances prices are holding to schedule. Domestic talc is quoted at from $15 to $18 per ton, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
100% Rag Ext. No. 1	.36	@	.37
100% Rag	.29	@	.30
75% Rag	.22	@	.23
65% Rag	.19	@	.20
50% Rag	.15½	@	.16½
25% Rag	.13	@	.14

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
No. 1 Sulphite	8.00	@	9.00
No. 2 Sulphite	7.00	@	8.00
No. 3 Sulphite	6.75	@	7.75
No. 4 Sulphite	6.50	@	7.50
Book, B Grade, Cased (f.o.b. mill less carload freight allowed)			
S. & S. C.	6.00	@	—
S. & S. C. Litho	6.25	@	—
M. F.	5.75	@	—
No. 4 Coated and Enamel	7.00	@	—
No. 4 Coated Litho	7.00	@	—
Tissues—Per Ream—			
White No. 1	.95	@	—
White No. 1 M. G.	.92½	@	—
White No. 1½	.67½	@	—
White No. 2	.62½	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.62½	@	—
Unbleached Toilet	2.60	@	3.30
Bleached Toilet	3.94	@	5.26
Paper Towels—			
Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—			
Roll, contract	42.50	@	—
Sheets	47.50	@	—
Kraft—			
No. 1 Northern	5.25	@	5.75
Standard	5.00	@	—
Southern	5.00	@	—
Glazed	4.50	@	—
Striped	4.75	@	—
Boards, per ton—			
News	47.50	@	50.00
Chip	45.00	@	47.50
Sgl. Mla. Ll. Chip	55.00	@	60.00
Jute Lined Chip	55.00	@	60.00
Kraft Liners	65.00	@	67.50
White Pat. Coated	67.50	@	70.00
Binders Boards	70.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	33.00	@	36.00
Dry	40.00	@	42.00
(Delivered)			
No. 1 Domestic and Canadian	33.00	@	36.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.90	@	4.50
Prime Qualities—			
Easy-Bleaching Sulphite	3.50	@	3.75
Strong Unbleached Sulphite	3.40	@	3.65
(On Dock, Atlantic Ports)			
Kraft Bleached	3.50	@	4.50
Kraft Light & Strong	2.75	@	3.75
Kraft No. 1	2.50	@	3.50
Kraft No. 2	2.50	@	2.75
(F.o.b. Pulp Mill)			
Kraft Domestic	2.50	@	3.25
(Delivered)			
Soda Bleached	2.90	@	—

Add 60 cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	9.00	@	9.25
Silesias, No. 1	6.75	@	7.00
New Unbleached	9.25	@	9.50
Blue Overall	7.50	@	8.00
Fancy	4.00	@	4.50
Washables	3.00	@	3.50
Mixed Khaki Cuttings	4.25	@	4.50
O. D. Khaki Cuttings	4.75	@	5.00

Old Rags

White, No. 1—			
Repacked	3.50	@	3.75
Miscellaneous	3.00	@	3.25
White, No. 2—			
Repacked	2.50	@	2.75
Miscellaneous	2.00	@	2.25
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.90	@	2.00
Roofing Rags—			
No. 1	Nominal		
No. 2	1.55	@	1.60
No. 3 (bagging)	1.20	@	1.30
No. 4	1.20	@	1.30
No. 5A	1.05	@	1.10

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.50
New Mixed Cuttings	2.00	@	2.25
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxfords	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.50	@	4.00
German Blue Linens	2.50	@	2.75
German Blue Cottons	2.00	@	2.25
Checks and Blues	2.00	@	2.25
Linsey Garments	2.25	@	2.35
Dark Cottons	2.15	@	2.25
Old Shopperies	1.75	@	2.00
New Shopperies	1.75	@	2.00
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.35
Domestic	2.15	@	2.25
Wool Tares, light	1.75	@	1.85
Wool Tares, heavy	2.20	@	2.35
Bright Bagging	1.70	@	1.75
Manila Rope—			
Foreign	5.00	@	5.25
Domestic	5.25	@	5.50
Jute Strings	2.75	@	3.00
Sisal Strings	2.60	@	2.75
Mixed Strings	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.25	@	3.50
Ordinary Hard White No. 1	2.60	@	2.70
Hard White No. 2	2.50	@	2.60
Soft White No. 1	2.40	@	2.50
Flat Stock—			
Stitchless	1.45	@	1.55
Overissue Mag	1.45	@	1.55
Solid Flat Book	1.40	@	1.45
Crumbled No. 1	1.20	@	1.25
Ledger Stock	1.30	@	1.35
New B. B. Chips	.65	@	.70
Manila—			
New Env. Cut	2.25	@	2.35
New Cuttings	1.90	@	2.10
Old Kraft Machine—			
Compressed bales	1.80	@	1.90
News—			
No. 1 White News	1.50	@	1.60
Strictly Overissue	.90	@	1.00
Strictly Folded	.70	@	.75
No. 1 Mixed Paper	.65	@	.70

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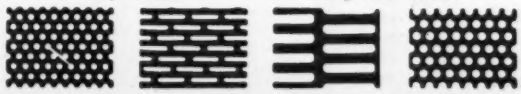
The Harrington & King PERFORATING Co.
5652 Fulmore St. Chicago, Ill. 114 Liberty St. New York, N.Y.

Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—			
India	.16	@	.18½
Belg. White Hemp	.17	@	.20½
India Compress	.16½	@	.17
Fine Polished—			
Fine India	.22	@	.24
Unpolished—			
Box	.11¾	@	.12¾
Paper Makers	.11½	@	.13¾
Tube Rope	.12½	@	.15¼
Wall Paper	.13½	@	.14¼
Wrapping	.17	@	.21
Soft Fiber Rope	.14¼	@	.15¼

(Hard Fibre)

Bond	.13½	@	.22
Anchor	.13	@	.14½
Manila	.21	@	.28

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28½	.29
75% Rag	.21½	.22
65% Rag	.18½	.19
50% Rag	.16	.16
25% Rag	.13½	.13½

Sulphite Bond & Ledgers—

	Bonds	Ledgers
No. 1 Sulphite	8.00	8.75
No. 2 Sulphite	7.25	8.25
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	6.50	7.50

(F. o. b. Mill)

Book, M. F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.75	@	—
Coated Lithograph	6.75	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	42.50	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Corload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.08	@	.08½
New White, No. 2.	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft.	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1.	.02	@	.02½
Blue Overall	.07	@	.07½
Cottons—According to grades—			
Washable, No. 2.	.02½	@	.04½
New Blue	.02	@	.02½
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	2.00	@	2.25
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¾
New Canvas	.04	@	.04½
New Black Mixed.	.02	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	2.00	@	2.10
Domestic No. 2	1.90	@	2.00
Roofing Bagging	1.75	@	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	4.50	@	—
Sisal Rope	3.00	@	—
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.25	@	2.50
No. 2	1.00	@	1.10
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	—	@	2.60
No. 2 Hard White.	2.20	@	2.25
No. 1 Soft White.	2.00	@	2.10
No. 2 Soft White.	1.75	@	—
No. 1 Mixed	—	@	.85
Solid Ledger Stock	—	@	1.75
Ledger Stock, white.	1.75	@	—
Ledger Stock, colored	1.50	@	—
No. 1 Books, heavy	1.20	@	1.25
Manila Cuttings	1.80	@	1.90
Print Manila	.75	@	.85
Container Manila	.80	@	—
Kraft Paper	1.75	@	—
No. 1 Mixed Paper	.60	@	.65
Straw Board Chip	.50	@	—
Binders Board Chip.	.50	@	—
Corrugated Board	.70	@	.80
Overissue News	.75	@	.80
Old Newspapers	.60	@	.65

BOSTON

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.65	8.65
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.25	7.25
No. 4 Sulphite	6.50	7.50

F.o.b. Mill

Book, Super	.06½	@	.09½
Book, M. F.	.06	@	.09
Book, Coated	.09	@	.18½
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.05¼	@	—
No. 2 Kraft	.05	@	—

(Delivered New England points)

Southern Kraft	.05	@	—
News Print Rolls	42.00	@	—
Straw Board, rolls	.00942.50	@	45.00
Filled News Board	50.00	@	52.50
Chip Board	47.50	@	50.00
Single Manila Lined Chip	57.50	@	62.50
Single White, Patent Coated News Board (Bender)	70.00	@	77.50
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	75.00	@	80.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.20	@	2.35
No. 1 Soft White.	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ldgers	.85	@	.90
No. 1 Books, heavy	1.40	@	—
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
Manila Env. Cuttings, extra quality	2.20	@	2.30
No. 1 Old Manila	.95	@	1.00
White Blank News	1.30	@	1.40
No. 1 Kraft	1.90	@	2.00
Mixed Papers	.60	@	.65
Print Manila	.75	@	.85
Container Manilas	.27½	@	—
Old Newspapers	.60	@	.65
Overissue News	.50	@	.65
Box Board Chips	.55	@	.60
Corrugated Boxes	.85	@	.90
Kraft corrugated boxes	1.60	@	1.65
Screening Wrappers	.60	@	.65

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	4.75	@	5.00
Domestic	5.00	@	5.30
Transmission Rope	2.00	@	2.25
Jute Rope	2.50	@	2.75
Soft Jute Strings	2.75	@	3.00
Jute Carpet Threads	1.75	@	2.00
Gunny No. 1—			
Foreign	2.50	@	2.60
Domestic	2.10	@	2.15
Bleachery Burlap	4.25	@	4.50
Scrap Burlap—			
Foreign	2.15	@	2.25
Domestic	1.90	@	2.10
Scrap Sisal	2.60	@	2.75
Scrap Sisal for Shredding	2.75	@	3.00
Wool Tares, heavy	2.40	@	2.60
New Burlap Cuttings	2.85	@	3.00
Aust. Wool Pouches.	3.25	@	3.30
Heavy Baling Bagging	2.40	@	2.60
Paper Mill Bagging	1.75	@	1.80
Bagging No. 2	1.70	@	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.04	@	.04¼
New White No. 1.	.09	@	.09¼
New White No. 2.	.06¼	@	.07
New Light Flannelettes	.07½	@	—
Silesias No. 1	.07¾	@	.08
New Black Silesias	.04¼	@	.04½
Soft Unbleached	.09½	@	.09¾
Blue Cheviot	.07½	@	.07¾
Fancy	.03¾	@	.04
Washable	.03	@	.03¼
Kraft, M. F.	6.00	@	—
Cottons—According to grades—			
Blue Overalls	.07½	@	.07¾
New Black, soft	.04¼	@	.04½
Khaki Cuttings	.04¾	@	.05
O. D. Khaki	.05	@	.05¼
Corduroy	.03¼	@	.03½
New Canvas	.07¾	@	.08¼
B.V.D. Cuttings	.08¾	@	.09

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.45	@	1.55
No. 2	1.45	@	1.50
No. 3	1.15	@	1.25

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.90	@	2.00
Dutch Blues	3.00	@	3.15
New Checks and Blues	2.85	@	3.00
Old Fustians	2.85	@	3.00
Old Linsey Garments	2.50	@	2.65
New Silesias	6.50	@	7.00

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¾
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	3.30	@	3.40
No. 1 Hard White.	2.60	@	2.70
No. 1 Soft White.	2.10	@	2.25
Ledger & Writings.	1.40	@	1.50
Solid Books	1.25	@	1.30
Blanks	1.50	@	1.65
Krafts	1.00	@	1.25
New Kraft Cuts	1.80	@	2.00
Manila Env. Cuts	2.20	@	2.35
Ex. No. 1 Manila	2.20	@	2.35
Print Manila	1.70	@	1.80
Overissue News	.80	@	.90
Old Newspapers—			
No. 1 Folded News	.80	@	.90
No. 1 Mixed Paper	.80	@	.90
Roofing Stocks—			
No. 1	2.00	@	2.25
No. 2	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	—
No. 1 Tints	.36½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	.15	@	—
No. 4 Tints	.16	@	—
No. 5 Bond—White	.11	@	—
No. 5 Bond—Tints	.12	@	—
No. 5 Bond—Golden Rod	.13	@	—
No. 5 Ledger—White	.11½	@	—
No. 5 Ledger—Tints	.12	@	—
No. 6 Bond—White	.10½	@	—
No. 6 Bond—Tints	.11	@	—
No. 6 Bond—Golden Rod	.12½	@	—
No. 7 Bond—White	.08¾	@	—
No. 7 Bond—Tints	.09¼	@	—
No. 7 Bond—Golden Rod	.10¾	@	—
Book—			
No. 1 M. F.	6.75	@	7.00
No. 2 M. F.	6.50	@	6.75
No. 3 M. F.	5.25	@	5.75
No. 1 S. C.	7.25	@	7.50
No. 2 S. C.	6.75	@	7.00
No. 3 S. C.	5.75	@	6.00
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.85	@	—
White Wrap	4.00	@	—
"B" Manila	4.90	@	—
No. 1 Manila	5.50	@	—
Fiber	5.50	@	—
Kraft, No. 2	5.50	@	—

F. o .b. Cars, Toronto)

News, per ton—			
Rolls (contract)	38.50	@	—
Sheets	45.50	@	—

Pulp

Ground wood	30.00	@	31.00
Unbleached Sulphite	52.00	@	53.00
Book (Class 1)	65.00	@	66.00
Writing (Class 2)	66.00	@	67.00
Select (Class 3)	67.00	@	68.00

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.50	@	—
Soft White	2.15	@	—
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock	1.15	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.55	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.75	@	—
Strictly Folded	.80	@	—
No. 1 Mixed Paper	.65	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09	@	.09¼
Fancy Shirt Cuttings	.03¼	@	.04